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ATTENUATION OF FALLOUT RADIATION AS A FUNCTION OF CONCRETE BLOCKHOUSE WALL THICKNESS

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October 1963

U. S. ARMY
NUCLEAR DEFENSE LABORATORY
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FOREWORD

This experiment was conducted to verify theoretical calculations of wall thickness effect on the shielding characteristics of a concrete blockhouse in a uniformly contaminated fallout field. The work was within the scope of Task Number 1A022601A089-01, "Studies and Investigations, Atomic Defense Techniques."

Acknowledgement

The authors wish to express their appreciation to Dr. L. V. Spencer of the National Bureau of Standards for the opportunity of using his monograph, "Structure Shielding Against Fallout Radiation", prior to its formal publication, and to Dr. H. J. Tiller for his technical assistance and careful judgment of the subject matter.

DIGEST

This experiment was conducted to verify theoretical calculations of wall thickness effect on the shielding characteristics of a concrete blockhouse in a uniformly contaminated fallout field.

Two gamma emitters, cobalt 60 and cesium 137, were used to simulate uniform planes of contamination. The dose rates at various locations within blockhouses with wall thickness of 48 psf, 93.7 psf, and 139 psf were measured with ionization-chamber dosimeters. Reduction factors were calculated from the data taken at the center detector positions and compared with reduction factors computed from the theoretical calculations of Dr. L. V. Spencer, National Bureau of Standards.

1. Experimental and theoretical reduction factors 3 feet and 6 feet above the center of the concrete blockhouse agreed within ±15 percent for a uniformly contaminated plane of cobalt 60, and within ±20 percent for cesium 137.

2. Cobalt 60 and cesium 137 radiation show approximately exponential attenuation of dose rate as a function of wall thickness ranging from 48 to 139 psf for detector heights of 0 (ground level), 3, and 6 feet.

MILITARY APPLICATION

Radiation hazards caused by fallout from nuclear explosions require the military to take advantage of all possible means of shielding to protect both the field armies and personnel in fixed military installations. One means of obtaining protection is to utilize available above-ground structures; however, the military commander must be furnished with quantitative estimates of the protection afforded by available structures. Spencer's method gives the means of obtaining this quantitative estimate of protection capabilities of structures. An experimental check on the accuracy of this method is essential.

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ATTENUATION OF FALLOUT RADIATION AS A FUNCTION OF CONCRETE BLOCKHOUSE WALL THICKNESS

CHAPTER I

INTRODUCTION

1.1 OBJECTIVES

This report presents one phase of a shielding program designed to test the validity of theoretical calculations for predicting the shielding afforded by structures against fallout radiation.

The specific objective of this experiment was to verify theoretical calculations of the effect of wall thickness on the shielding characteristics of a concrete blockhouse in a uniformly contaminated fallout field.

1.2 BACKGROUND

An atomic or thermonuclear weapon detonated on or near the surface of the ground produces radioactive fallout. This fallout is taken into the atmosphere and distributed over the surrounding area in a pattern determined by the prevailing meteorological conditions. This radioactive fallout, covering roofs of buildings and the surrounding ground, constitutes a major hazard to the surviving population. Because of this, judicious use must be made of all remaining above-ground structures for protection from the radiation hazard caused by the fallout. It is essential, therefore, to know just how much protection can be expected from these structures in a fallout field. This information is obtained by direct measurement or calculation.

Some experimental work on structure shielding has been done on typical residential structures[1] and on relatively simple structures[2] in simulated fallout fields. Because of geometric differences between one building and another, however, these results could only be applied directly to similar structures. Recently, a prediction method developed by Dr. L. V. Spencer at the National Bureau of Standards (NBS) became available. This work, contained in Dr. Spencer's monograph on structure shielding[3], formed the basis of the Office of Civil Defense (OCD) Engineering Manual[4] used by engineers and architects to predict the protection afforded by existing and proposed structures against fallout radiation. Although some of the assumptions and calculations made by Dr. Spencer were based on experimental work, a need existed for a full scale experimental check of the entire prediction method. The most logical approach to such an experiment was to begin with a

simple type of structure, and then proceed to more complex structures. Therefore, a simple blockhouse was chosen as the experimental structure. The results of experiments conducted to determine the effect of roof thickness on the gamma dose rate inside the blockhouse have been reported previously[5]. The present report concerns the gamma radiation penetration through the walls of the blockhouse.

1.3 THEORY

Details of the calculations involved in developing Spencer's prediction method are reported in his monograph on structure shielding against fallout radiation[3]. The monograph was designed to predict the shielding characteristics of any structure if certain physical parameters (dimensions, construction materials, wall thickness, etc.) are known.

Spencer accomplished this by reducing as much as possible the number of independent parameters characterizing a fallout radiation shielding problem. Fallout distribution was assumed to be of uniform density and of infinite extent. The changing energy spectrum that occurs after the detonation of a weapon was resolved by calculating data for three different energy spectra, namely (1) 1.12-hour fission products, (2) cobalt 60, and (3) cesium 137. The differences in the density and the shielding characteristics of construction materials of various buildings were simplified by converting to a parameter called effective mass thickness (X) with the dimensions of weight per unit area. The expression for this parameter is

$$X = 2(Z/A)\ \rho\ \Delta \tag{1.1}$$

Where: (Z/A) is the ratio of atomic charge, Z, to atomic mass number, A, averaged over the constituent elements of the material.

ρ is the density of the material

Δ is the barrier thickness

The dimensionless factor $2(Z/A)$ is very nearly unity for most important construction materials, such as wood, brick, and concrete; consequently, the effective mass thickness for these materials nearly equals the true mass thickness, defined as weight per unit area.

Structure shielding analysis may be visualized by examining Figure 1.1, taken directly from Figure 20.1 of Reference 3. Figure 1.1 shows a blockhouse, similar to the structure studied in the present experiment, with fallout on the roof and on the surrounding ground. It is desired that the dose rate be determined at detector position A at the center of the building, so that at that point the shielding effectiveness of the structure can be determined.

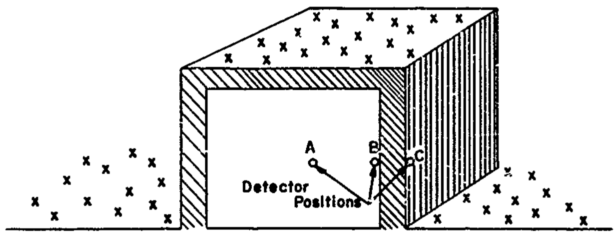


Figure 1.1 Blockhouse, with fallout on roof and ground (Figure 20.1, L. V. Spencer[3]).

A convenient measure for the shielding effectiveness is the (dose) reduction factor R_A for the center point inside the structure. This reduction factor is defined as the ratio of the dose rate, D_A, measured at the detector point A inside the structure to the free field dose rate, D_o, measured by an unshielded detector 3 feet above the infinite and uniformly contaminated plane source, i.e.:

$$R_A = \frac{D_A}{D_o} \qquad (1.2)$$

The dose rate at detector D_A is due to radiation from all directions. Because of the low density of air, most radiation will travel in straight lines from the points of emergence from the walls. Thus, the radiation penetrating the roof is due primarily to fallout laying on the roof, plus skyshine (from ground contamination), which is significant for relatively thin roofs. The radiation penetrating the walls originates from fallout on the ground surrounding the building. Since, as pointed out by Spencer, the radiation penetrating the roof will have little semblance in intensity or directional distribution to radiation penetrating the walls, it is appropriate to separate the detector response accordingly.

In Figure 1.1, detector positions B and C, just inside and outside the wall, represent points at the same height as detector position A. Radiation from ground contamination that contributes to the detector response at position A must first pass through the wall material and then travel through the distance between the wall and the detector. The total reduction of detector response at A can be represented as the product of two factors. The barrier reduction factor accounts for the attenuation of radiation by interactions with the wall material; clearly, this factor is a function of the mass thickness X of the wall. It should be noted that the ratio of the response of detectors placed at positions B and C provides a very good estimate of the magnitude of the barrier reduction factor. The geometry reduction factor allows for further reduction of the radiation intensity due to the finite distance between detector positions B and A; obviously, this factor is a function of the solid angle fraction ω subtended by the wall as seen from the detector position A. A more detailed analysis reveals that the geometry reduction factor depends also on the mass thickness X of the wall as an additional variable.

The procedures, using Spencer's method, for calculating the reduction factors for the blockhouse are shown later in Section 3.4. Certain basic parameters, such as effective mass thickness, X, and the solid angle fractions, are easily calculated. From these, other factors are obtained directly from charts and graphs in Spencer's monograph.

CHAPTER 2

EXPERIMENTAL EQUIPMENT AND PROCEDURES

2.1 BLOCKHOUSE

The blockhouse is shown in Figure 2.1. The inside dimensions of the square structure were 12 by 12 by 8 feet. The floor and the basic 4-inch-thick walls were poured concrete. Wall thicknesses were added in increments of 3 13/16 inches, or 45.7 psf, to a total thickness of 11 5/8 inches, or 139 psf.

TABLE 2.1 WALL THICKNESS OF CONCRETE BLOCKHOUSE

Wall Number	Thickness of Concrete	Mass Thickness
	inches	psf
1	4	48
2	7 13/16	93.7
3	11 5/8	139

For convenience, the mass thickness (psf) will be used to indicate the appropriate wall thickness in subsequent sections of this report.

The 2-by-2-foot windows, centered in three of the walls, were filled with concrete blocks to the same thickness as the walls. The fourth wall contained a 2-by-6-foot doorway. A 48-psf sliding door (Figure 2.2) was installed to shield out the contribution of scattered radiation through this opening.

Supporting the roof materials was a 10-inch wide flange beam (Figure 2.1) that spanned the top of the structure at the midpoints of the walls having opposing windows. The roof for the 48-psf and 93.7-psf walls consisted of 1 [illegible]/32 inches of steel supported by a 1/2-inch layer of plywood extending from the flange beam to the tops of the opposing walls. The mass

Figure 2.1 Experimental blockhouse showing 48-psf wall and 50.2-psf roof

Figure 2.2 Experimental blockhouse showing 139-psf wall, sliding door, and 91.5-psf roof.

thickness value of this roof was 50.2 psf. The roof for the 139-psf wall, however, was increased to 91.5 psf by replacing the steel with two layers of 3 13/16-inch thick concrete block supported by 4-inch steel channels extending from the flange beam to the tops of the opposing walls. The thickness of the roof was increased to eliminate the contribution of scattered radiation through the roof. Thus, the dose rates at the detector positions were considered to represent only radiation penetrating the walls.

2.2 FALLOUT SIMULATION

<u>2.2.1 Source Positions</u>. A continuous distribution of fallout radiation was simulated by dividing the field about the test structure into an array of squares and by placing a point isotropic source at the center of each. Instead of having sources at each of the points simultaneously, a single source was moved over the successive centers until the total area represented was covered. Because of the symmetry of the experimental structure, only one-eighth of the surrounding fallout field required simulation. Image detector positions were placed within the structure to obtain the dose contribution for the entire field.

Figures 2.3 through 2.5 show the source positions in relationship to the blockhouse. These figures show that the contaminated area is bounded by two straight lines intersecting at an angle of 45° at the center of the structure.

The grid spacing was chosen so that the outside dimension of the structure was a multiple of the grid spacing adjacent to the structure. The overall size of the 48-psf wall building was 152 by 152 inches. Thus, the individual grid spacing for the 48-psf wall was 25 1/3 by 25 1/3 inches, or 4.46 ft^2. To reduce the number of dose-rate measurements, the grid area was increased by a factor of 4 after every third row.

A similar pattern was followed in determining the source positions for the 93.7-psf wall. The overall size of the building increased to 160 by 160 inches; therefore, the size of the grid adjacent to the blockhouse was 26 2/3 by 26 2/3 inches, or 4.93 ft^2. Likewise, the grid area was increased by a factor of 4 after every third row.

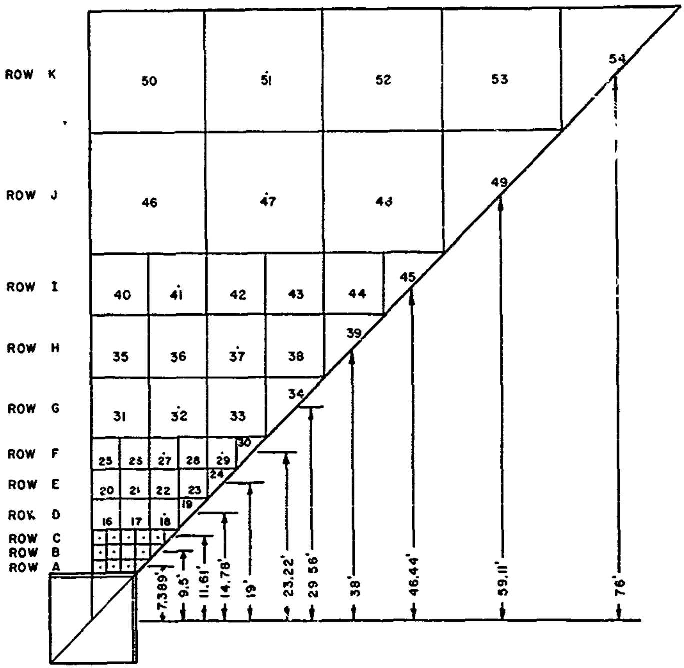


Figure 2.3 48-psf wall grid pattern, rows A-K, point source positions 1-54.

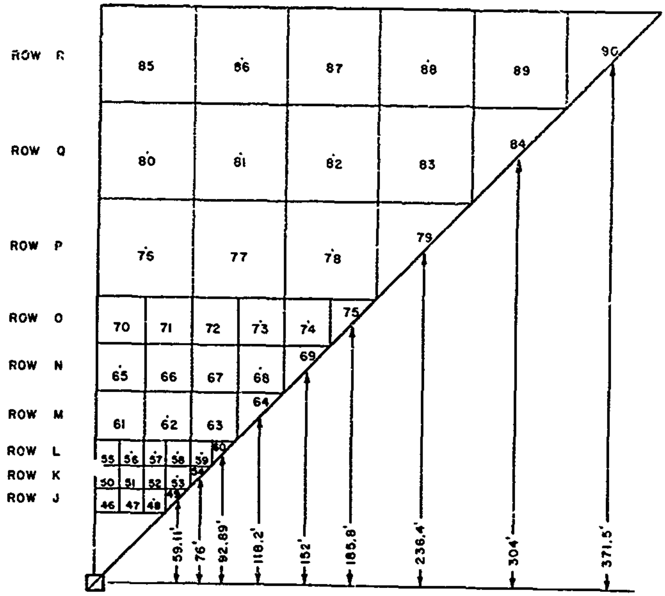


Figure 2.3a 48-psf wall grid pattern, rows J-R, point source positions 46-90.

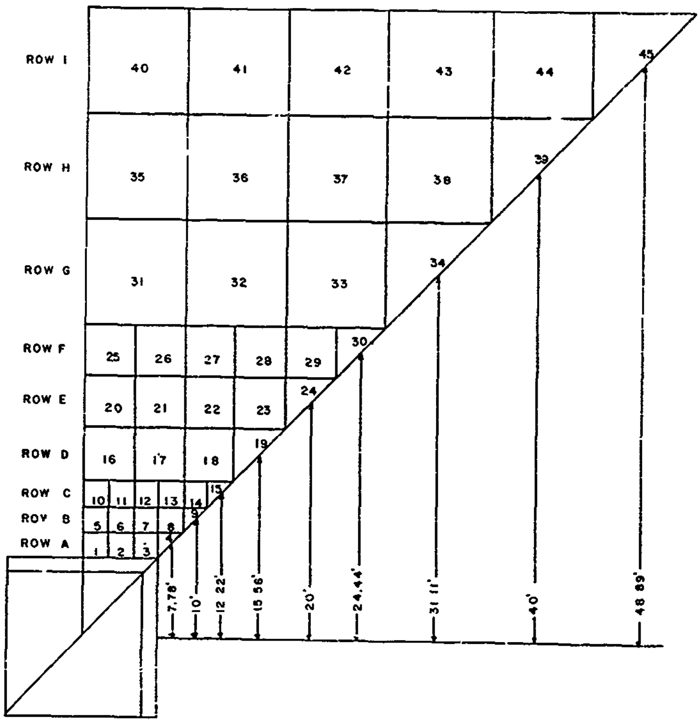


Figure 2.4 93.7-psf wall grid pattern, rows A-I, point source positions 1-45.

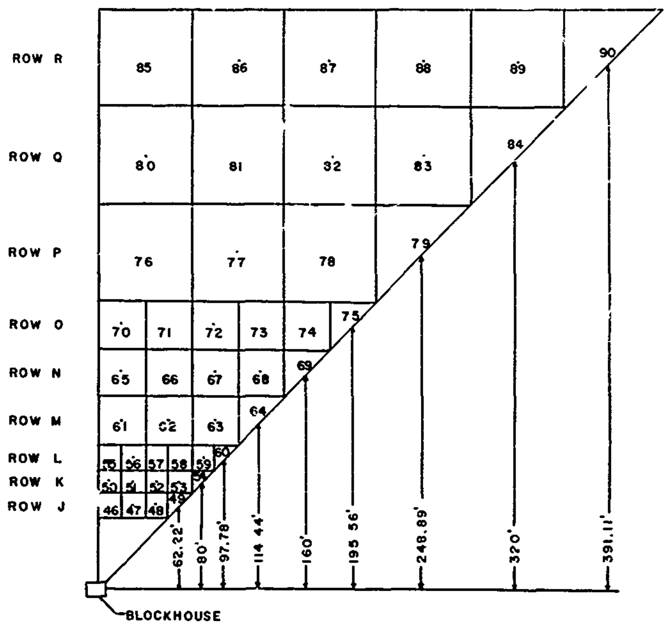


Figure 2.4a. 93.7-psf wall grid pattern, rows J-R, point source positions 46-90.

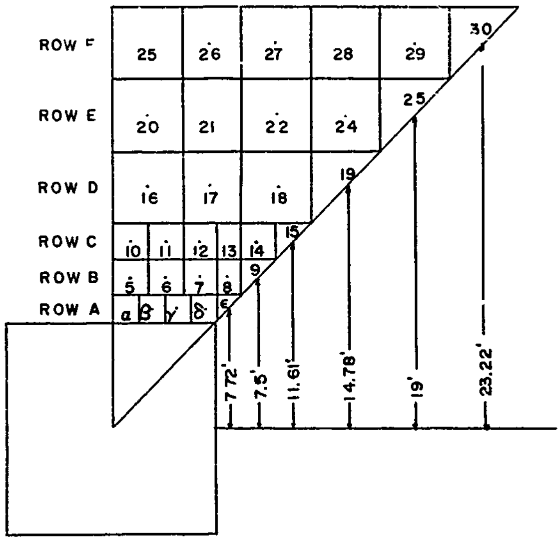


Figure 2.5 139-psf wall grid pattern, rows A-F, point source positions α-ε and 5-30. Remaining rows are the same as those for 48-psf wall grid pattern (Figure 2.3a).

Except for Row A, the same grid size used for the 139-psf wall was used for the 48-psf wall. Row A was divided into five grid areas (see Figure 2.5) rather than the four used for the 48-psf wall to facilitate area representation by the single point source. The grid size in Row A was 17 1/3 by 21 inches.

2.2.2 Detector Positions. The detector layout is shown in Figures 2.6 and 2.7. Figure 2.6a is a plan of the building showing the position of the primary detectors with respect to the walls of the building, and Figure 2.6b shows the detector positions with respect to the floor. This information is summarized in Table 2.2.

TABLE 2.2 POSITION OF DETECTORS INSIDE BLOCKHOUSE

Detector Position	Perpendicular Distance to Wall I feet	Perpendicular Distance to Wall II feet	Height Above Floor feet
A	1	1	3
B	3 1/2	3 1/2	3
C 6'	6	6	6
C 3'	6	6	3
* C 0'	6	6	0
D	3 1/2	6	3
E 4'	1	6	4
E 3'	1	6	3
E 2'	1	6	2

* Note: This detector position was at ground level directly above the center of a 16 by 16 by 16-inch hole in the center of the blockhouse.

Primary detectors (capital letters) and image detectors (small letters) were placed within the building as shown in Figure 2.7. Figure 2.8 illustrates the method employed to determine the dose rate at the primary positions using only one-eighth of the field about the structure. In Figure 2.8a, it was desired to measure the dose rate within the structure, at position A, from radiation originating from contaminant in the four shaded squares and in the four unshaded squares. Because of symmetry, the source-barrier-detector arrangement could be represented by three image detector positions so as to obviate placing a source in three of the four shaded areas of Figure 2.8a. Furthermore, for each of the detector positions, there was an unshaded square contributing the same radiation field as a shaded area. Therefore, the unshaded area

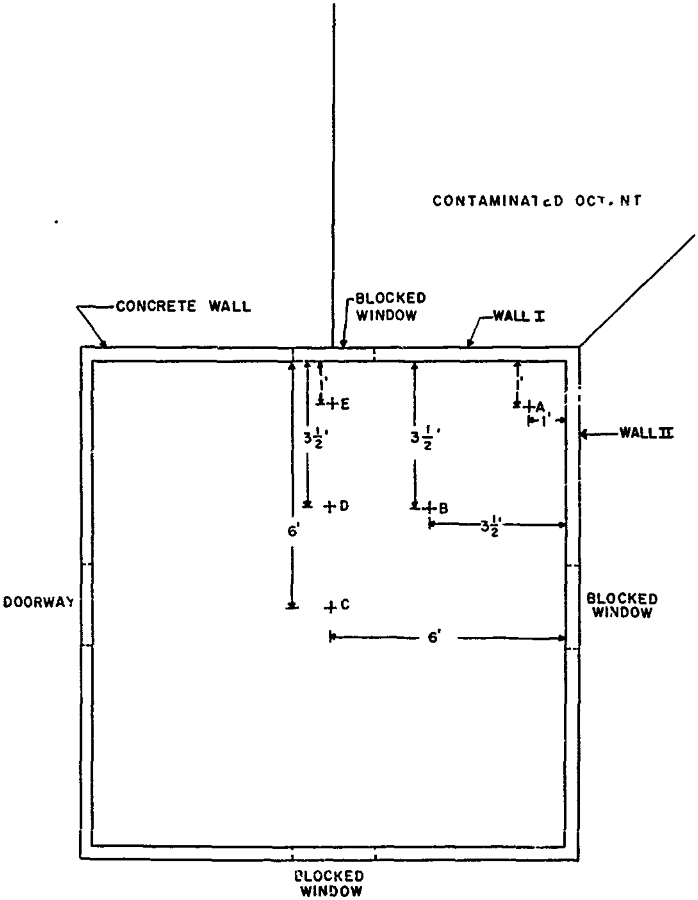


Figure 2.6a Plan of primary detector positions within blockhouse.

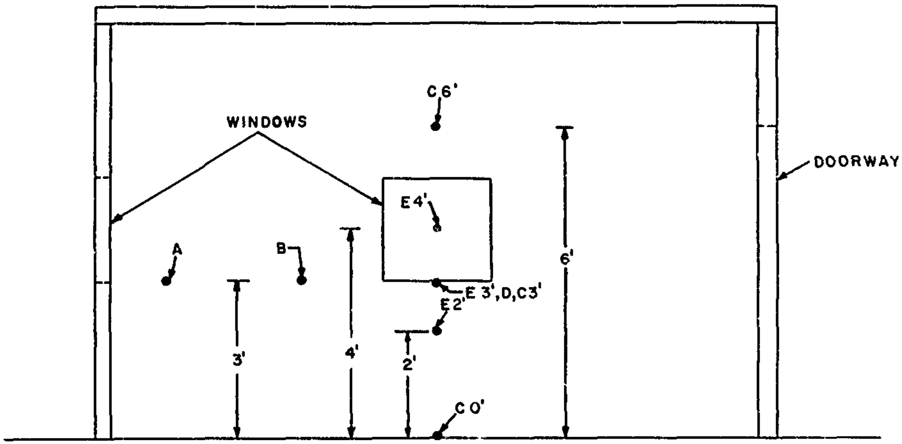


Figure 2.6b Section showing elevations of detector positions

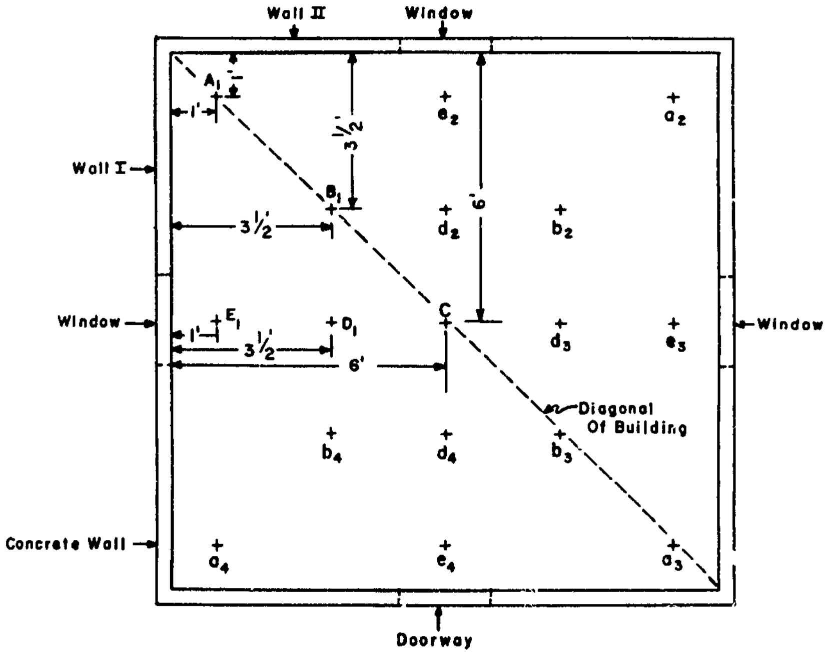
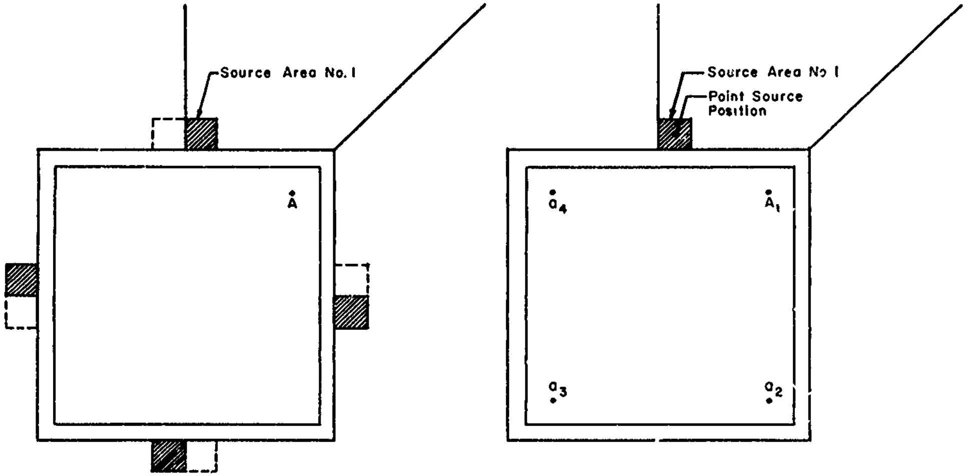


Figure 2.7 Plan of primary and image detector positions.



a
Distributed Source And Detector Plan To Determine Dose Rate At Corner of Structure For Source Area No. I Only.

b.
Actual Experimental Arrangement To Determine Dose Rate At Primary Position A_1.

Figure 2.8 Illustration of experimental detector arrangement.

contribution could be accounted for by doubling the contribution indicated by a source at the center of a shaded area. As an example, the dose rate, D_A, at position A for the eight contaminated areas shown in Figure 2.8c was

$$D_A = 2(D_{A_1} + D_{a_2} + D_{a_3} + D_{a_4}) \quad (2.\_)$$

For the center detector positions, the three image detector positions were superimposed upon the primary position. Therefore, the dose rate at a center position for the above-mentioned contaminated areas was eight times the single dose-rate measurement.

As shown in Figures 2.3, 2.4, and 2.5, the diagonal areas were treated as right triangles and the source was placed at the midpoint of the hypotenuse of the triangular area. In determining the continuous distribution dose rates it was necessary to halve the single dose-rate measurements to properly weight this area.

2.3 RADIOACTIVE SOURCES

The gamma radiation sources used in these experiments were cobalt 60 and cesium 137, (Figures 2.9 and 2.10). Cobalt 60, emitting 2 gamma photons of 1.17 and 1.33 MeV, was used in source strengths of 0.346 curies, 3.25 curies, 98.7 curies, and 395 curies. Cesium 137, emitting a single gamma photon of 0.661 MeV, was used in source strengths of 1.32 curies, 8.69 curies, and 100 curies.

2.4 SOURCE HANDLING EQUIPMENT AND PROCEDURES

In simulating fallout contamination with point sources, the high intensity radioactive sources were exposed remotely to insure personnel safety, and were exposed close to the ground to simulate ground contamination. The following methods were used to accomplish this:

1. Direct placement of source on the ground
2. Airlift system alone
3. Airlift system with tilter
4. Airlift system with tilter and reverse-airflow system

The first method involved removing the source from the shield with a permanent magnet and quickly placing it in a plastic holder resting on the source position. This procedure was used only with the 1.32-curie cesium 137 source and the

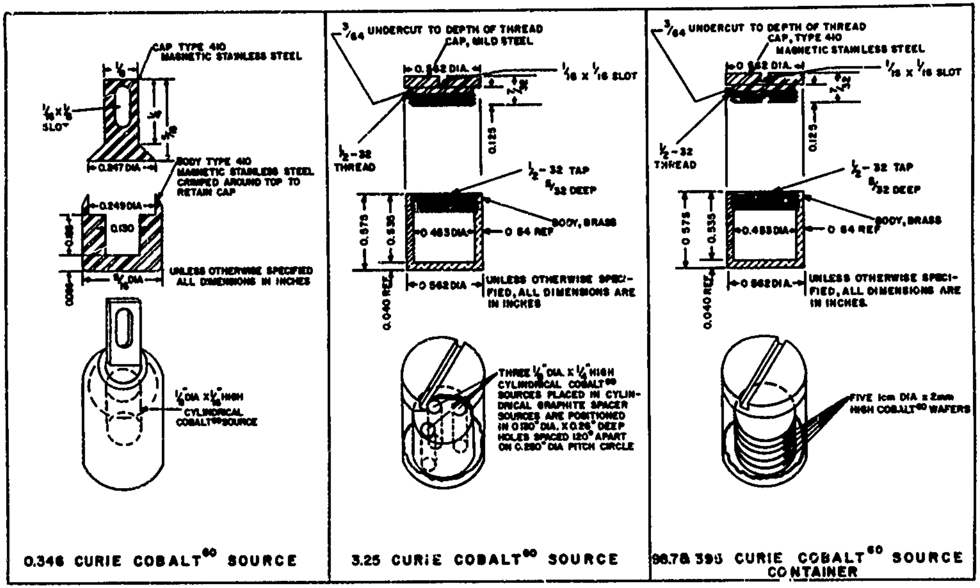
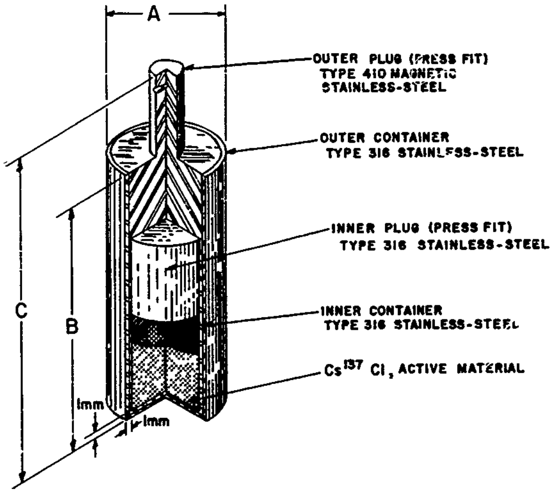


Figure 2.9 Detail of construction of cobalt 60 sources.



Strength of Source	Dimension			Dimensions of Active Material	
	A	B	C	Diameter	Height
curies	inches			inches	
1.32	0.252	0.925	1.181	0.157	0.157
8.69	0.329	1.38	1.754	0.236	0.224
100	0.492	1.575	1.950	0.394	0.905

Figure 2.10 Detail of construction of cesium 137 sources.

0.346-curie cobalt 60 source for the positions of Rows A, B, and C with the 48-psf wall.

A section drawing of the airlift system is shown in Figure 2.11. Briefly, the system consisted of the source, the shield, and a riser-tube assembly. To lift the source from its lead shield, a lead plug was removed and a stainless steel riser plug, containing two concentric aluminum tubes, was inserted into the cavity of the shield. An air hose near the base of the aluminum tubes was connected to an electrically operated air compressor that forced air down the outer aluminum tube and under the source, pushing the source upward into the aluminum tube. A preset stop rod in the riser tube controlled the height to which the source would move. The source remained suspended in the aluminum tube until the power to the air compressor was turned off.

The airlift system alone was used only for Row P through Row R (Figure 2.4) where it was not required that the source be positioned near the ground. At these points the source-to-detector distances were large; therefore, the difference in slant thickness through the blockhouse walls was insignificant whether the source was near the ground or as much as 2 feet above the ground.

Beginning at Row D, where it was necessary to position a high-activity source near the ground (source could not be handled manually), the airlift system was used in conjunction with the tilting mechanism, Figure 2.12. This device consisted of a two-wheeled trailer with mounted supports holding two trunnions. A face plate was welded to the adjacent ends of each trunnion. Adapter plates with bolt holes were welded to opposite sides of each shield to match the plates on the trunnion. The shield was placed between the plates and bolted in place. With the riser tube clamped in place, the shield was tilted by remotely activating a 110-volt AC ratio motor. This motor drove a system of pulleys and V-belts that reduced the rotation speed and caused the shield to tilt to about 110° from the vertical. The source was then ejected from the shield with the air compressor. Source height above the ground was adjusted, prior to exposure, by means of a positioning rod of the same length as the riser tube. At source positions near the building (Rows D and E), the height of the source above the ground was approximately 3 1/2 inches. At source positions farther from the blockhouse it was sometimes necessary to place the source as much as 8 inches above the ground so that the source would "see" the entire building. The source was returned to the shield by uprighting the riser tube and shield. An average detector response was determined for the dose contribution during

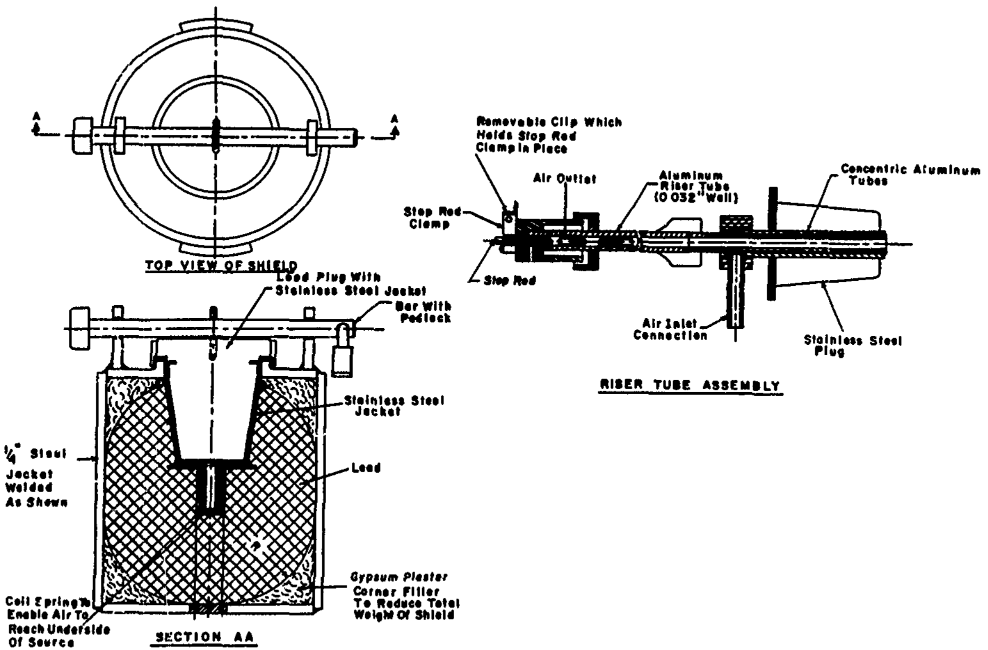


Figure 2.11 Sectional view of source shield with riser tube and plug.

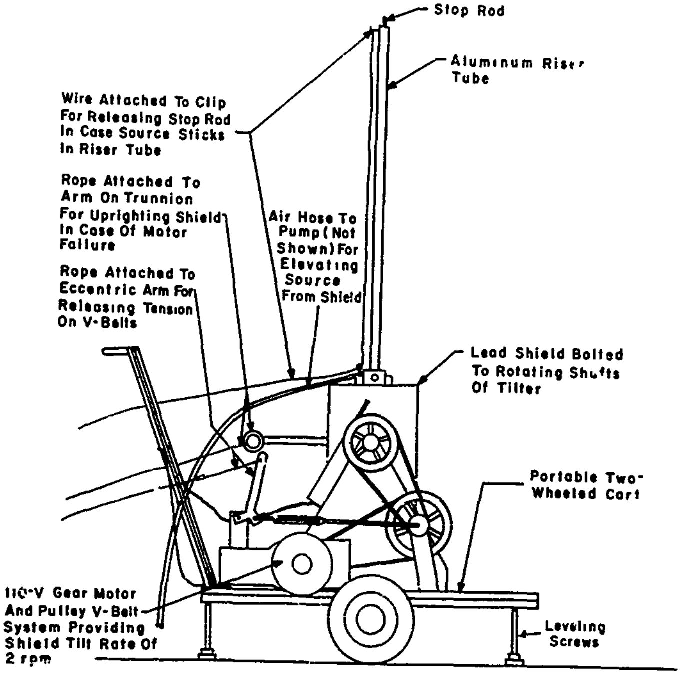


Figure 2.12 Shield tilter.

the time that the source traveled from the ground position to nearly above the shield. This contribution was subtracted to give the detector response while the source was at ground level.

The fourth and final source-exposure method, the airlift system and tilter with the reverse air-flow system, was employed for source positions near the blockhouse where the wall thickness under study was too great to permit use of a low activity source. Since the dose contributed while the source was being returned from the ground position to the shield would be a significant part of the total dose reaching the detector, it was undesirable to use the tilter mechanism with the normal air-lift system. This system, shown in Figure 2.13, entailed the use of an adapter (an aluminum tube the same inside diameter and wall thickness as the riser tube) which was threaded on the upper end of the riser tube. A rubber hose was attached to a small aluminum tube extending from the cap of the adapter. This tube and the air inlet at the base of the riser tube were connected to opposing outlets of two, remotely operated, three-way solenoid valves which controlled the direction of the flow of air. With air pressure being supplied by a compressor pump, air could either be made to flow through the shield, pushing the source to the end of the adapter, or to flow through the adapter, thus, pushing the source back into the shield. This method was used to expose a high-intensity source to a height of 1/2 inch above the ground at all source positions of Rows A, B, and C with the 93.7-psf and 139-psf walls.

To reduce the number of source-position measurements, a method was devised for estimating the dose rate at as many source positions as possible. Sufficient radial lines were drawn from the center of the building to the boundary of the experimental radiation field so as to pass through each source position. Results of the dose-rate measurements for the 90 source positions for the 48-psf wall thickness indicated that, for the center detector positions, a plot of the dose rate versus horizontal distance from source to detector for the source positions on a given radial line yielded a straight line on log-log paper. Therefore, for the greater wall thickness, the dose rate at many source positions could be estimated by obtaining sufficient points to construct the dose-rate distance curve. The source positions for which this procedure was used are indicated in the tables of the appendix.

2.5 INSTRUMENTATION

<u>2.5.1 Radiation Detectors</u>. Quanitative measurements of the dose inside the blockhouse were obtained with the following

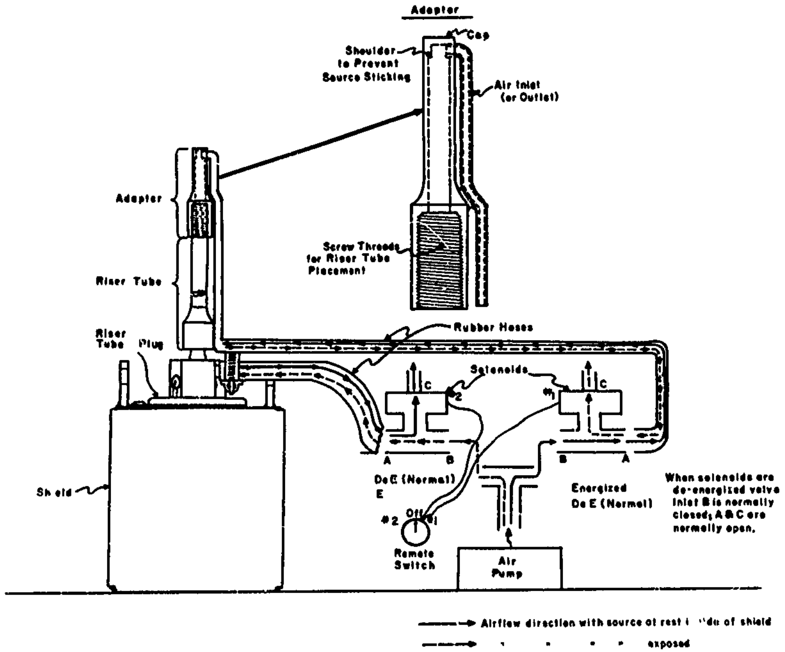


Figure 2.13 Reverse-airflow system.

air-equivalent ionization chamber dosimeters and charger-reader (Figure 2.14)

Dosimeters:	Victoreen Model 239, Range: 0-10 mr
	Victoreen Model 208, Range: 0-1 mr
Charger-Reader:	Victoreen Model 287 Minometer

These detectors were calibrated against a Victoreen Model 130 dosimeter, range 0 to 0.25r, charged and read on a Victoreen condenser r-meter model 70, which had been calibrated by the National Bureau of Standards (NBS)[8]. The calibration was made at two energy levels, 215 keV and 1,250 keV. The correction factor for cesium 137 was obtained by linear interpolation for 661 keV photon energy level between the two measured energies. It was estimated that the correction factors were accurate within ±3 percent.

When taking dose measurements, the dosimeters were exposed for a time sufficient to give a reading of not less than 50 percent of full scale. Readings could be reproduced within ±1 percent of full scale. The total dose received by a dosimeter was recorded with the time required for the exposure. This information was converted to dose rate in milliroentgens per hour.

2.5.2 Survey and Detection Instruments. Survey and detection instruments included the following:

Tracerlab Model SU3 Laboratory Monitor
Nuclear-Chicago-Model 2586 Survey Meter (Cutie-Pie)
Victoreen Model 389 Survey Meter (Thyac)

The Tracerlab Model SU3 laboratory monitor was used to indicate the exit and return of the source to the shield. This system, in conjunction with an electric timer, was also used to determine the length of the exposure time.

The survey meters were used to estimate the dose rate within the blockhouse at the various detector positions.

2.5.3 Miscellaneous Instrumentation. Correction factors were necessary to correct the responses of the dosimeters to standard atmospheric conditions (0°C and 760 mm Hg).

Atmospheric pressure was measured by a U. S. Army Signal Corps mercury barometer. The instrument could be read to ±0.1 mm Hg.

Air temperatures were measured by a Yellow Springs Instrument Co. Model 44 Telethermometer equipped with a Model 405 thermistor air probe.

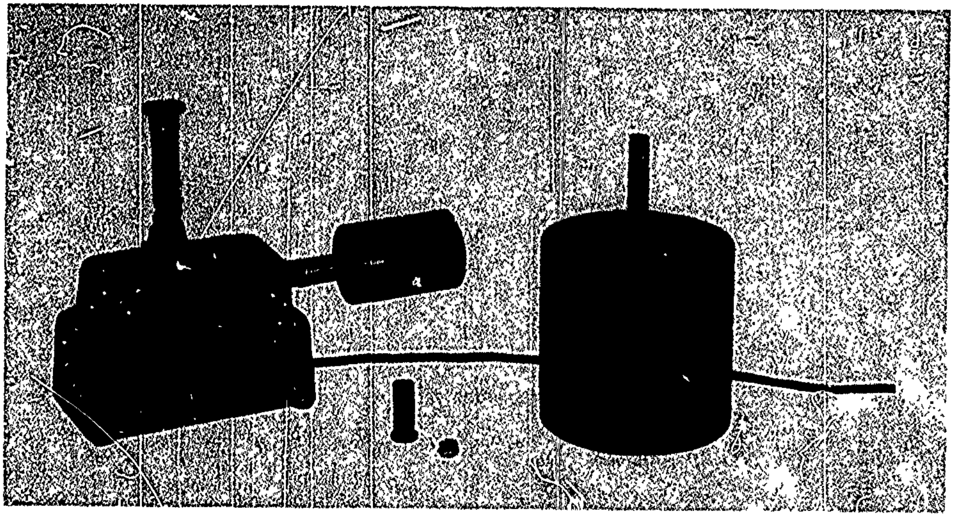


Figure 2.14 Dosimeters and charger-reader.

2.5.4 Field Laboratory Facility. A 16-foot-square wooden building near the edge of the test area provided a reasonably dust-free place to charge and read the dosimeters. A 32-inch thick concrete-block shielding wall was erected along two sides of the building to reduce the radiation level sufficiently to allow continued occupancy by test personnel and to permit dosimeters to be read while the field test was in progress.

CHAPTER 3

EXPERIMENTAL AND THEORETICAL RESULTS AND DISCUSSION

3.1 DATA TREATMENT

Table 3.1 is a sample data sheet showing the treatment of the radiation measurements for the 48-psf wall from one source position. The radiation dose measurements were corrected for atmospheric conditions, radioactive decay, and dosimeter calibration, and normalized to yield the dose rate for a source strength of 1 curie. The normalized dose rates were recorded on analysis sheets as shown in Appendix A, Tables A1 through A6. The point-source data were then integrated to obtain the dose rate from a square radiation source field with uniform contamination density. For example, in Table A-1, the sum of the dose rates 3 feet above the center of the floor of the blockhouse from the source positions of Row A (source positions 1-4), multiplied by 8 and by the area simulated by each source position, shows the dose rate at this location, if Row A completely surrounded the building.

3.2 INFINITE FIELD DOSE RATES

In these experiments the radiation field could be constructed only to a finite distance from the blockhouse; whereas, in an actual fallout field, the dose rate at a detector location within the building is due to an effective infinite field of contamination. The infinite field dose rates within the blockhouse were determined by extrapolation based on experimental open field dose rates given in Reference 7.

From data provided in Reference 7, the dose rate 3 feet above the open field was determined for the same source geometry and source strength per unit area as that used for the blockhouse wall and roof penetration measurements. Contaminant located on the roof for the blockhouse measurements was located on the ground for the open field measurements. Tables 3.2 and 3.3 show the dose rate 3 feet above the open field for cobalt 60 and cesium 137, respectively. The physical size of the source area is indicated by the distance, d, which is the minimum distance from the center of the field to the outer boundary of the square simulated fallout field, or, as indicated in Tables 3.2 and 3.3, half the length of the contaminated field.

Tables 3.4 through 3.9 show the experimental dose rates within the blockhouse in (mr/hr)/(curie/ft^2) totaled through each square radiation area for the center detector positions at the 6-foot and 3-foot heights and at ground level.

TABLE 3.1 SAMPLE DATA SHEET

Wall Thickness: 48 psf (4 inches concrete)
Source Position #1
Source: 0.346-Curie Cobalt 60
Atmospheric Correction Factor: 0.996
Radioactive Decay Correction Factor: 1.093
Curie Normalization Factor (to 1 curie): 2.89

Detector Position	Dose Reading	Exposure Time	Dosimeter Calibration Correction Factor	Corrected Dose Rate
	mr	min		(mr/hr)/curie
A_1	7.95	23.0	1.11	72.4
a_2	6.9	33.09	1.10	43.3
a_3	0.96	5.60	1.17	37.9
a_4	0.97	5.60	1.21	39.[illegible]
B_1	8.6	9.73	1.09	182
b_2	7.55	23.0	1.10	68.3
b_3	9.05	33.09	1.11	57.5
b_4	9.2	17.16	1.10	111
C6'	7.35	23.0	1.07	64.5
C3'	9.2	17.16	1.09	110
CO'	10.0	17.16	1.15	126
D_1	8.8	9.73	1.10	188
d_2	8.9	17.16	1.09	107
d_3	7.0	17.16	1.08	82.8
d_4	7.6	23.0	1.15	71.6
$E4'_1$	6.7	9.73	1.11	144
$e4'_2$	8.1	23:00	1.14	75.8
$e4'_3$	7.3	33.09	1.10	45.7
$e4'_4$	7.7	33.09	1.11	48.8
$E2'_1$	7.25	2.76	1.10	547
$e2'_2$	9.8	23.0	1.11	89.2
$e2'_3$	7.55	33.09	1.09	47.1
$e2'_4$	8.6	33.09	1.10	53.7

TABLE 3.2 CUMULATIVE DOSE RATES 3 FEET ABOVE AN OPEN FIELD CONTAMINATED WITH COBALT 60

Row	$\frac{d}{2}$ Length of Field	Cumulative Dose Rate
	feet	$(mr/hr)/(curie/ft^2)$
AA*	2.12	28,100
BB*	4.24	69,300
CC*	6.33	101,000
A	8.44	126,000
B	10.6	147,000
C	12.7	163,000
D	16.9	191,000
E	21.1	212,000
F	25.3	229,000
G	33.8	256,000
H	42.2	277,000
I	50.7	294,000
J	67.6	319,000
K	84.4	339,000
L	102	355,000
M	135	380,000
N	169	397,000
O	202	411,000
P	270	432,000
Q	338	446,000
R	405	456,000

*This portion of the radiation field would be occupied by the experimental blockhouse.

TABLE 3.3 CUMULATIVE DOSE RATES 3 FEET ABOVE AN OPEN FIELD CONTAMINATED WITH CESIUM 137

Row	$d = \frac{\text{Length of Field}}{2}$	Cumulative Dose Rate
	feet	(mr/hr)/(curie ft^2)
AA*	2.12	7,490
BB*	4.24	18,300
CC*	6.36	27,000
A	8.44	34,100
B	10.6	39,600
C	12.7	44,200
D	16.9	51,700
E	21.1	57,500
F	25.3	62,100
G	33.8	69,100
H	42.2	74,700
I	50.7	79,000
J	67.6	85,700
K	84.4	90,800
L	101	95,200
M	135	101,000
N	169	105,000
O	202	109,000
P	270	114,000
Q	338	117,000
R	405	119,000

*This portion of the radiation field would be occupied by the experimental blockhouse.

TABLE 3.4 CUMULATIVE EXPERIMENTAL DOSE RATES AT CENTER DETECTOR POSITIONS, COBALT 60, 48-PSF WALL THICKNESS

Source Row	d Length of Field / 2	Cumulative Dose Rates		
		Center - 6 ft	Center - 3 ft	Center-Ground Level
	feet	(mr/hr)/(curie/ft²)		
A	8.44	6,670	9,420	10,300
B	10.6	13,200	17,700	18,300
C	12.7	19,400	24,900	24,900
D	16.9	28,800	34,700	33,500
E	21.1	35,900	42,000	39,600
F	25.3	41,700	48,100	44,200
G	33.8	51,500	58,000	52,100
H	42.2	59,200	66,000	57,800
I	50.7	64,600	72,100	61,900
J	67.6	73,500	81,400	67,600
K	84.4	80,200	88,900	72,100
L	101	85,500	94,600	76,100
M	135	93,400	103,000	82,400
N	169	99,500	110,000	87,100
O	203	104,000	114,000	90,700
P	270	110,000	121,000	95,700
Q	338	115,000	126,000	99,400
R	405	117,000	128,000	101,000

TABLE 3.5 CUMULATIVE EXPERIMENTAL DOSE RATE AT CENTER DETECTOR POSITIONS, COBALT 60, 93.7-PSF WALL THICKNESS

Source Row	[a] Length of Field / 2	Cumulative Dose Rates: Center - 6 ft	Center - 3 ft	Center-Ground Level
	feet	(mr/hr)/(curie/ft^2)		
A	8.89	2,120	3,880	3,910
B	11.1	4,170	6,510	6,350
C	13.3	6,170	8,810	8,310
D	17.8	9,440	12,400	11,200
E	22.2	12,200	15,300	13,400
F	26.0	14,500	17,600	14,900
G	35.6	17,800	20,900	16,800
H	44.4	20,700	23,600	18,000
I	53.3	23,300	26,100	19,200
J	71.1	26,700	29,500	20,900
K	88.9	29,400	32,300	22,600
L	107	31,600	34,500	24,100
M	142	34,700	32,300	25,900
N	178	37,000	40,100	27,500
O	213	38,800	41,900	28,600
P	284	41,200	44,300	30,300
Q	356	43,000	46,200	31,700
R	427	44,300	47,600	32,800

TABLE 3.6 CUMULATIVE EXPERIMENTAL DOSE RATES AT CENTER DETECTOR POSITIONS, COBALT 60, 139-PSF WALL THICKNESS

Source Row	d Length of Field / 2	Cumulative Dose Rates: Center - 6 ft	Center - 3 ft	Center-Ground Level
	feet	(mr/hr)/(curie/ft²)		
A	8.44	371	666	722
B	10.6	897	1,460	1,640
C	12.7	1,500	2,190	2,260
D	16.9	2,490	3,350	3,260
E	21.1	3,390	4,290	4,020
F	25.3	4,040	5,000	4,640
G	33.8	5,130	6,190	5,360
H	42.2	5,970	7,120	5,960
I	50.7	6,640	7,800	6,310
J	67.6	7,610	8,770	6,850
K	84.4	8,430	9,630	7,280
L	101	8,990	10,200	7,680
M	135	9,850	11,200	8,240
N	169	10,700	12,100	8,540
O	202	11,300	12,700	8,900
P	270	12,100	13,600	9,590
Q	338	12,900	14,500	9,860
R	405	13,400	14,900	10,200

TABLE 3.7 CUMULATIVE EXPERIMENTAL DOSE RATES AT CENTER DETECTOR POSITIONS, CESIUM 137, 48-PSF WALL THICKNESS

Source Row	$\frac{d}{2}$ Length of Field, feet	Cumulative Dose Rates (mr/hr)/(curie/ft²): Center - 6 ft	Center - 3 ft	Center-Ground Level
A	8.45	1,010	1,660	1,110
B	10.6	2,190	3,210	2.520
C	12.7	3,310	4,500	3,670
D	16.9	5,350	6,540	5,360
E	21.1	6,930	8,290	6,480
F	25.7	8,200	9,520	7,410
G	33.8	10,100	11,400	8,250
H	42.2	11,600	12,800	8,940
I	50.7	12,700	13,900	9,420
J	67.6	14,200	15,500	10,200
K	84.4	15,400	16,800	10,800
L	101	16,400	17,700	11,300
M	135	17,700	19,100	12,100
N	169	18,700	20,100	12,800
O	203	19,500	20,900	13,200
P	270	20,600	22,000	14,100
Q	338	21,300	22,800	14,600
R	405	21,900	23,400	15,100

TABLE 3.8 CUMULATIVE EXPERIMENTAL DOSE RATES AT CENTER DETECTOR POSITIONS, CESIUM 137, 93.7-PSF WALL THICKNESS

Source Row	Length of Field $\frac{d}{2}$	Cumulative Dose Rates		
		Center - 6 ft	Center - 3 ft	Center-Ground Level
	feet	(mr/hr)/(curie/ft²)		
A	8.89	259	475	475
B	11.1	569	911	871
C	13.3	869	1,280	1,180
D	17.8	1,250	1,680	1,510
E	22.2	1,620	2,060	1,780
F	26.7	1,930	2,370	2,010
G	35.6	2,350	2,790	2,270
H	44.4	2,720	3,160	2,500
I	53.3	3,020	3,470	2,670
J	71.1	3,410	3,870	2,860
K	88.9	3,760	4,220	3,070
L	107	4,040	4,510	3,220
M	142	4,440	4,920	3,470
N	178	4,770	5,240	3,690
O	213	5,020	5,510	3,860

TABLE 3.9 CUMULATIVE EXPERIMENTAL DOSE RATES AT CENTER DETECTOR POSITIONS, CESIUM 137, 139-PSF WALL THICKNESS

Source Row	℄ Length of Field / 2	Cumulative Dose Rates		
		Center - 6 ft	Center - 3 ft	Center-Ground Level
	feet	(mr/hr)/(curie/ft³)		
A	8.44	26.8	52.8	62.9
B	10.6	72.2	128	141
C	12.7	130	208	209
D	16.9	240	341	310
E	21.1	329	432	375
F	25.3	402	509	43[illegible]
G	37.8	516	629	512
H	42.2	600	718	572
I	50.7	669	788	614
J	67.6	780	909	695
K	84.4	859	998	760
L	101	921	1,070	804

Figures 3.1 through 3.6 show the cumulative dose rates from Tables 3.4 through 3.9 plotted versus d, defined as half the length of the source field or the perpendicular distance from the boundary of the source field to the center of the blockhouse. The top curve of each figure is the 3 foot-high open-field dose rate obtained from data in Reference 7. For values of d greater than 100 feet, the resulting curves for the various wall thicknesses show a family of curves parallel to the open-field curve. It was assumed that the constant ratios between the open-field dose rate and the dose rates at the center of each of the three structures continued for an infinite distance. This made it possible to determine the infinite field doses within the structures based on the open-field dose rate reported in Reference 7.

The cobalt 60 source field extended to a distance, d, of 405 feet for the 48-psf and 139-psf walls, and to a distance, d, of 427 feet for the 93.7-psf wall. The data from Reference 7 indicate that 92 percent of the infinite field dose rate was obtained by the 405-foot field, and 92.5 percent of the infinite field dose rate was accounted for by the 427-foot field. The infinite field dose rate 3 feet above the floor at the center of the blockhouse (wall thickness, 48 psf), in the cobalt 60 radiation field was determined to be

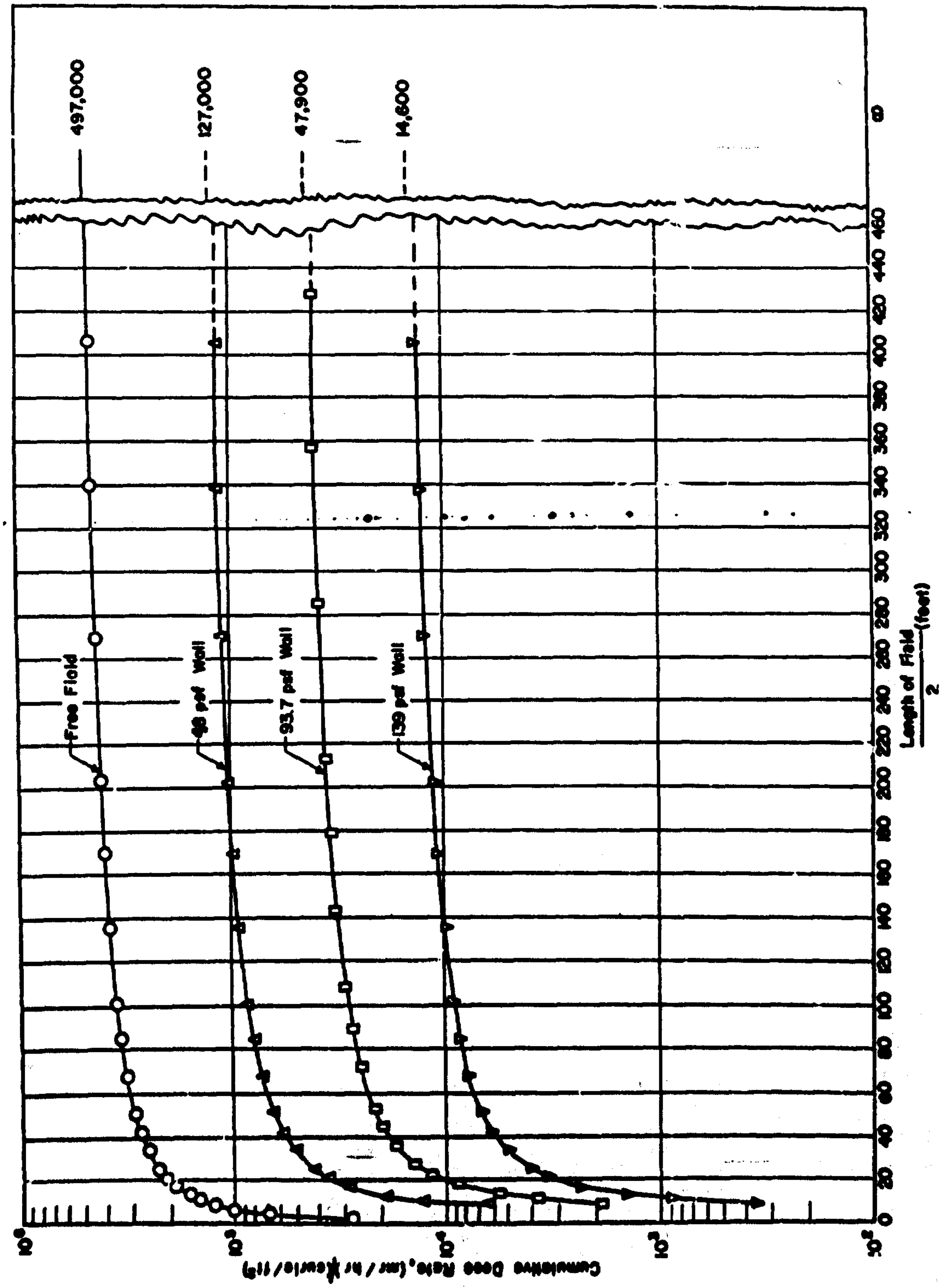
$$D_{C_{3'}} = \frac{\sum_{i=A}^{R} D_i}{0.92} \qquad (3.1)$$

Where: $\sum_{i=A}^{R} D_i$ indicates the sum of the dose rates from source rows A through R.

Similar calculations were made for the 6-foot and ground-level detector positions for all wall thicknesses.

Because of the limited strength of the cesium 137 source, it was not possible to obtain a radiation source field as extensive as that for cobalt 60. With the 48-psf wall, the cesium 137 radiation field extended to a distance, d, of 338 feet. A field of this size represented 92 percent of the infinite field dose. The source field for the 93.7-psf wall could be extended only to 213 feet which included only 87 percent of the infinite field dose. Finally, the cesium 137 source field for the 139-psf wall extended only to 101 feet which represents approximately 75 percent of the infinite field dose. The infinite field dose rates for the various wall thicknesses are summarized in Table 3.10.

Figures 3.7 and 3.8 show the infinite field dose rate versus wall thickness for cobalt 60 and cesium 137, respectively. The dose rate, D_i, at zero wall thickness was obtained by subtracting


Free Field
48 psf Wall
93.7 psf Wall
139 psf Wall
497,000
127,000
47,900
14,600
Cumulative Dose Rate, (mr / hr)/(curie/ft²)
Length of Field / 2 (feet)
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 ∞
10⁶
10⁵
10⁴
10³
10²

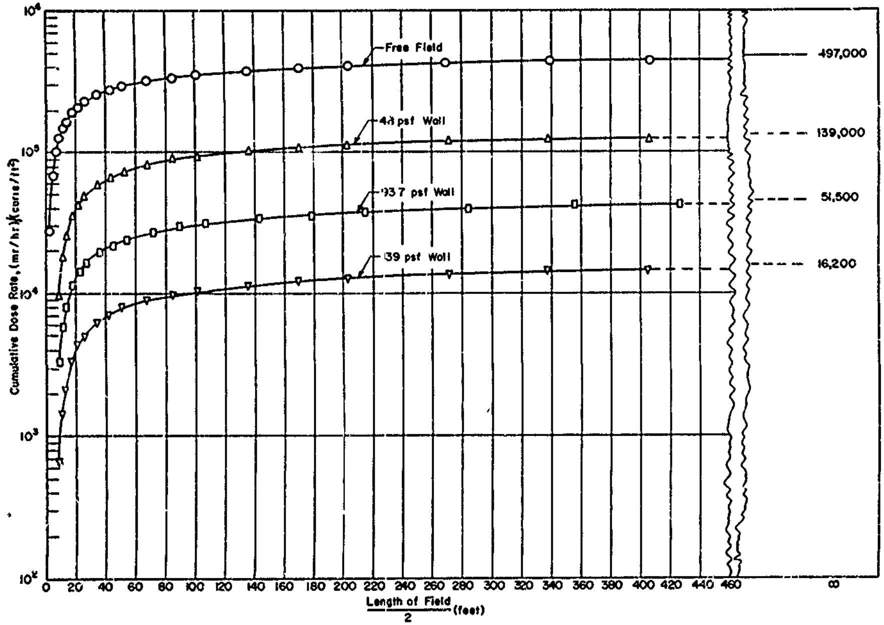


Figure 3.2 Cumulative dose rate versus size of field at the 3-foot height in the center of the blockhouse. Source: Cobalt 60.

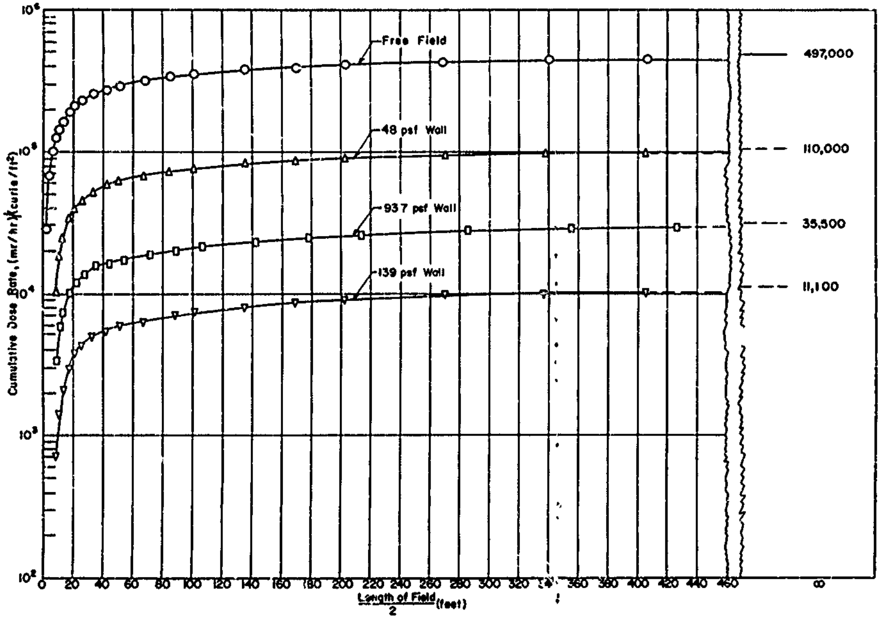


Figure 3.3 Cumulative dose rate versus size of field at ground level in the center of the blockhouse. Source: Cobalt 60.

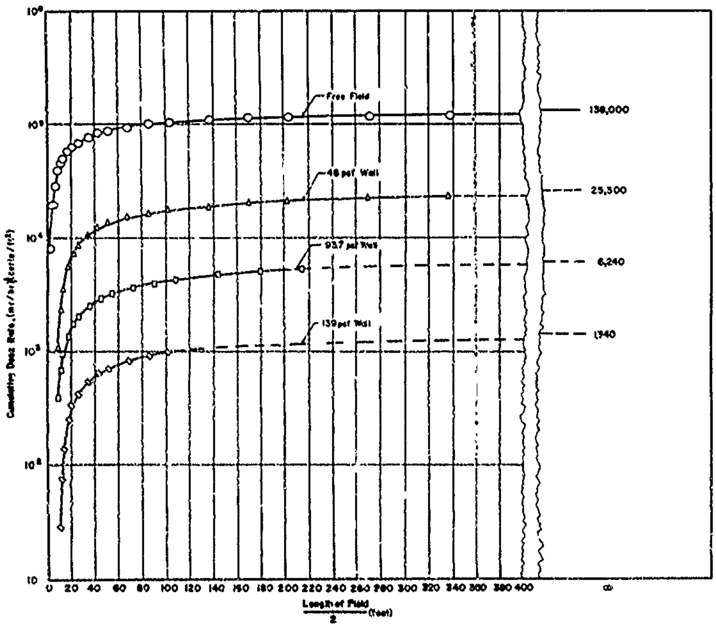


Figure 3.4 Cumulative dose rate versus size of field at the 6-foot height in the center of the blockhouse. Source: Cesium 137.

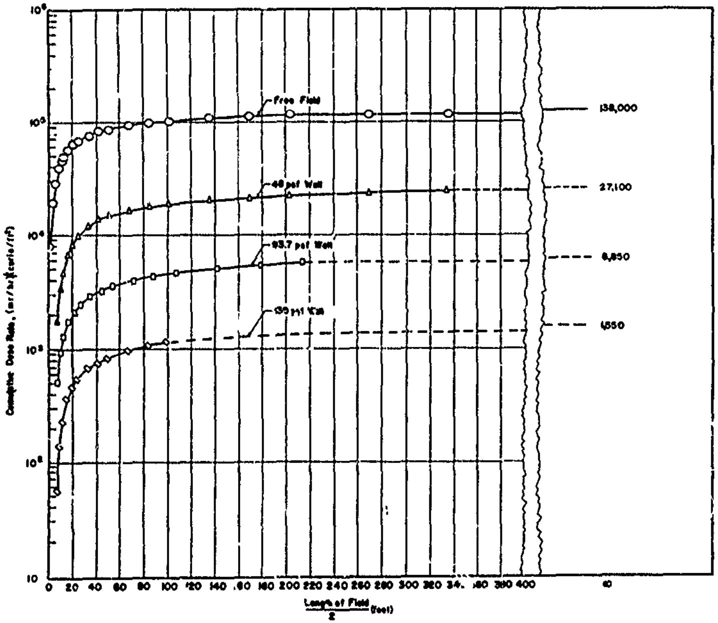


Figure 3.5 Cumulative dose rate versus size of field at the 3-foot height in the center of the blockhouse. Source: Cesium 137.

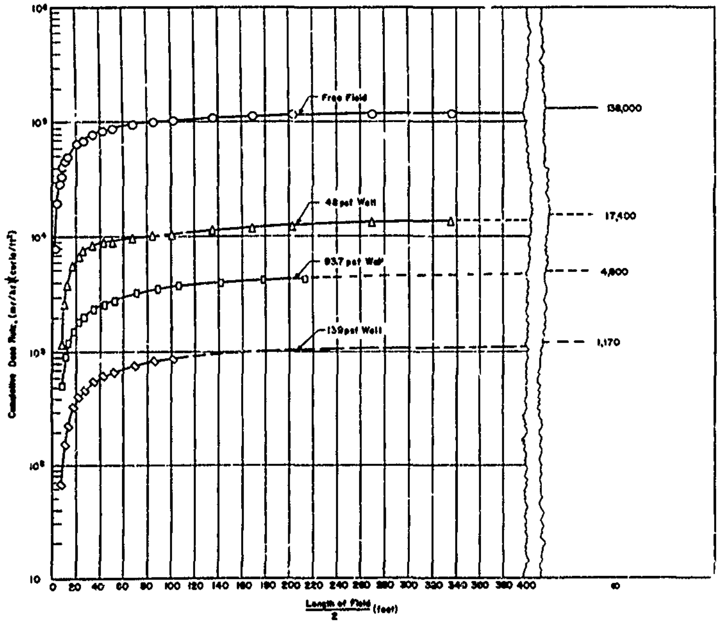


Figure 3.6 Cumulative dose rate versus size of field at ground level in the center of the blockhouse. Source: Cesium 137.

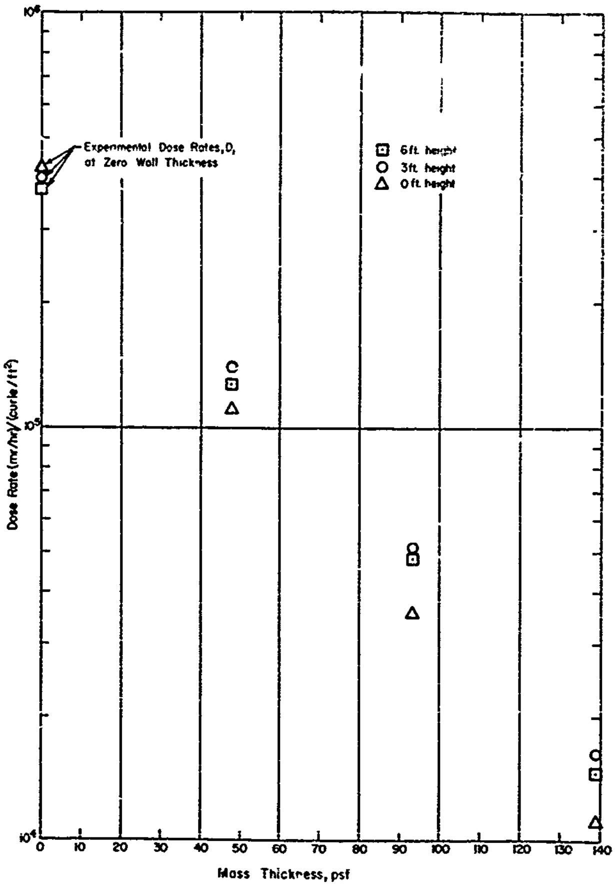


Figure 3.7 Infinite field dose rate versus wall thickness in the center of the blockhouse.
Source: Cobalt 60.

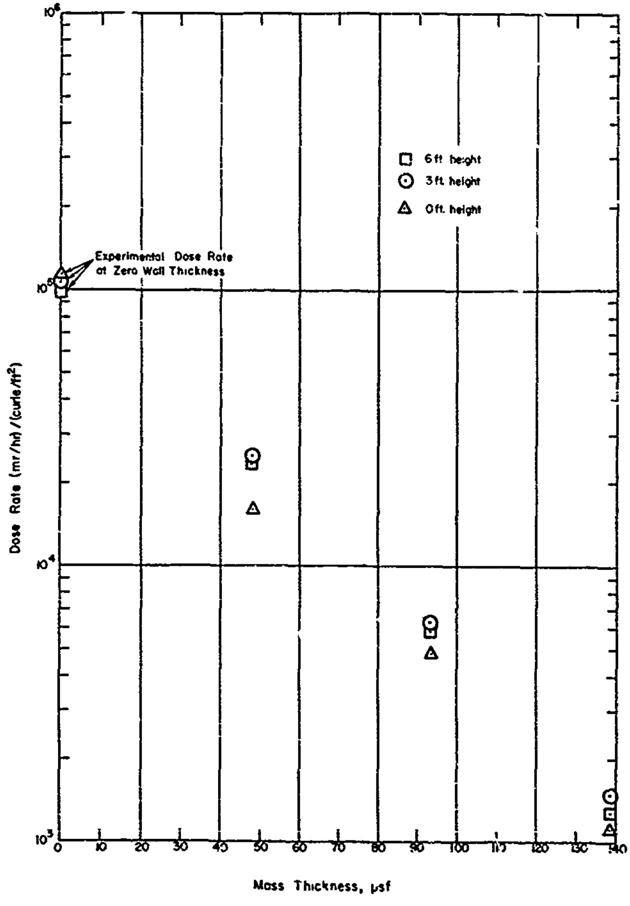


Figure 3.8 Infinite field dose rate versus wall thickness in the center of the blockhouse.
Source: Cesium 137.

TABLE 3.10 INFINITE FIELD DOSE RATES AT THE CENTER POSITIONS OF THE CONCRETE BLOCKHOUSE

Detector Height	48-psf Wall	93.7-psf Wall	139-psf Wall
feet	$(mr/hr)/(curie/ft^2)$	$(mr/hr)/(curie/ft^2)$	$(mr/hr)/(curie/ft^2)$
Cobalt 60			
6	127,000	47,900	14,600
3	140,000	51,500	16,300
0	111,000	35,400	11,100
Cesium 137			
6	23,400	5,750	1,280
3	24,800	6,160	1,480
0	15,700	4,770	1,110

the contribution of sources within the area covered by the blockhouse from the infinite field dose rate. Both cobalt 60 and cesium 137 radiation show approximately exponential attenuation of dose rate as a function of wall thickness up to 139 psf for detector heights of 0 (ground level), 3, and 6 feet.

3.3 EXPERIMENTAL REDUCTION FACTORS

The experimental reduction factors, R, were determined by dividing the experimental infinite field dose rate, D, from Table 3.9, by the open-field dose rate, D_o, determined from Reference 7. For example, the reduction factor 3 feet above the center of the blockhouse floor for the 48-psf wall in a cobalt 60 field is

$$R = D/D_o = \frac{140{,}000\ (mr/hr)/(curie/ft^2)}{497{,}000\ (mr/hr)/(curie/ft^2)} = 0.282 \qquad (3.2)$$

The reduction factor at the same position in a cesium 137 field is:

$$R = D/D_o = \frac{24,800\ (mr/hr)/(curie/ft^2)}{128,000\ (mr/hr)/(curie/ft^2)} = 0.194 \qquad (3.3)$$

The experimental reduction factors are listed in Table 3.11. Also shown are the theoretical reduction factors as calculated by Spencer's method and explained in Section 3.4.

3.4 THEORETICAL REDUCTION FACTORS

Details of Spencer's methods of obtaining the formulas used in the calculation of the reduction factors are given in Reference 3; therefore, no extensive discussion will be given in this report. The formulas used in calculating the theoretical reduction factors are as follows:

$$R_{theoretical} = D/D_o = 4\left[W(X,h)\ W_{a1}(X,h,\omega)\right] \qquad (3.4)$$

Where:

the factor of 4 converts the contribution through one wall to account for the four walls of the blockhouse; the function $W(X,h)$ is the barrier reduction and is dependent upon the effective mass thickness, X, of the wall and the height, h, of the detector above the ground.

The function $W_{a1}(X,h,\omega)$ is the geometry reduction factor and is written as follows:

$$W_{a1}(X,h,\omega) = b(X)\ W_a(h,\omega) + 1.15\left[1 - b(X)\right] P_a^{(s)}(\infty,\omega) \qquad (3.4a)$$

Where:

$b(X)$ is the proportion of unscattered gamma rays estimated by the ratio

$$P^{(o)}(X)/P(X)$$

Where:

$P^{(o)}(X)$ is a function obtained by subtracting $P^{(s)}(X)$, the total detector response due to scattered radiation from a point source in an infinite homogeneous medium, from $P(X)$, the total detector response to radiation from a point source in an infinite homogeneous medium, or

$$P^{(o)}(X) = P(X)-P^{(s)}(X) \qquad (3.4b)$$

$W_a(h,\omega)$ is a function describing detector response to radiation incident in a limited cone of directions about an axis parallel to the primary source plane at height, h, relative to the response of a 2π detector.

$P_a^{(s)}(\infty,\omega)$ is the ratio of the detector response to scattered radiation from a point source incident within a cone of directions about the radial axis from detector to source to the total response of an isotropic detector to the scattered radiation, extrapolated for the limit of infinite distance from source to detector.

The factor 1.15 is introduced into the expression to normalize the point source data $P_a^{(s)}$ to the plane source data W_a.

In all cases, ω is the solid angle fraction subtended by the wall at the detector and was calculated according to Section 41, Reference 3.

Values of all functions shown in Equations 3.4 and 3.5 were obtained from graphs shown in Reference 3. The theoretical results in Table 3.11 were obtained by substituting the appropriate values in these equations.

3.5 COMPARISON OF EXPERIMENTAL AND THEORETICAL REDUCTION FACTORS

Figures 3.9 through 3.14 show the experimental and theoretical reduction factors versus wall thickness obtained from the data shown in Table 3.11. For cobalt 60 (except for the ground-level detector position) the maximum difference between experiment and theory was approximately 15 percent. For cesium 137 (except for the ground-level detector position) the maximum difference between experiment and theory was approximately 20 percent (maximum of 5 percent for the 3-foot height).

For the ground level detector position, the theoretical reduction factors were higher than the experimental. For cobalt 60, the difference between experiment and theory was as much as 45 percent; for cesium 137, as much as 30 percent. This greater difference at the ground level detector may be attributed in part to energy degradation caused by shielding of the detector by the ground and to the uncertainty of the values which were used in Equation 3.4 for calculating the theoretical reduction factors. These were obtained from graphs which were read either from the 3-foot height curve or extrapolated to zero height. Further, Spencer's monograph states that serious errors could result from using Equation 3.4 in situations where the detector is far removed from being directly opposite the center of the wall. Thus, it is possible that the theoretical reduction factors presented are too conservative.

TABLE 3.11 EXPERIMENTAL AND THEORETICAL REDUCTION FACTORS FOR CENTER DETECTOR POSITIONS

	Wall Thickness					
Detector Height	48 psf		93.7 psf		139 psf	
(feet)	Experimental	Theoretical	Experimental	Theoretical	Experimental	Theoretical
			COBALT 60			
6	0.26	0.24	0.096	0.084	0.029	0.030
3	0.28	0.30	0.10	0.11	0.033	0.036
0	0.22	0.26	0.071	0.096	0.022	0.032
			CESIUM 137			
6	0.16	0.15	0.046	0.039	0.0097	0.0088
3	0.20	0.19	0.050	0.048	0.011	0.011
0	0.13	0.16	0.035	0.044	0.0085	0.010

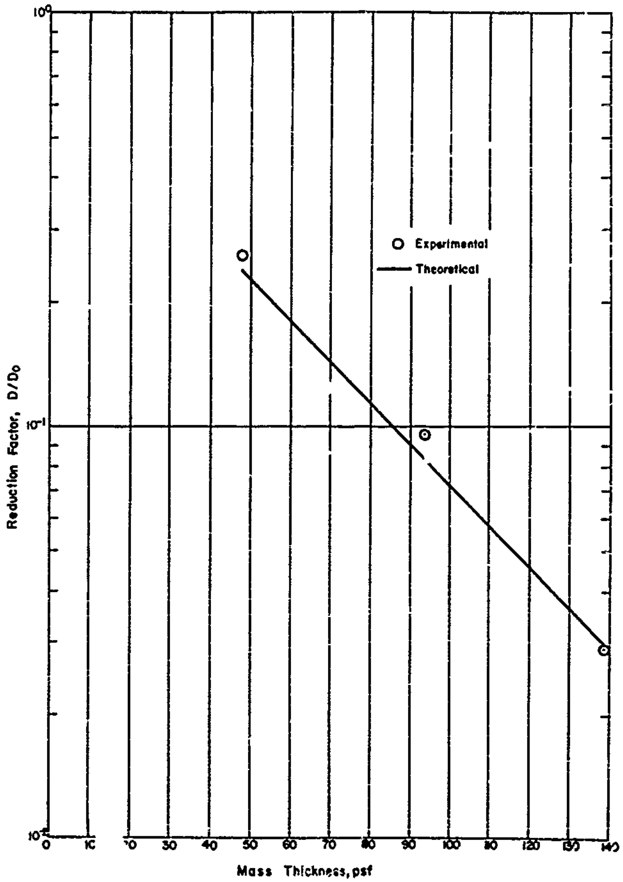


Figure 3.9 Experimental and theoretical reduction factors versus wall thickness at the 6-foot height in the center of the blockhouse. Source: Cobalt 60

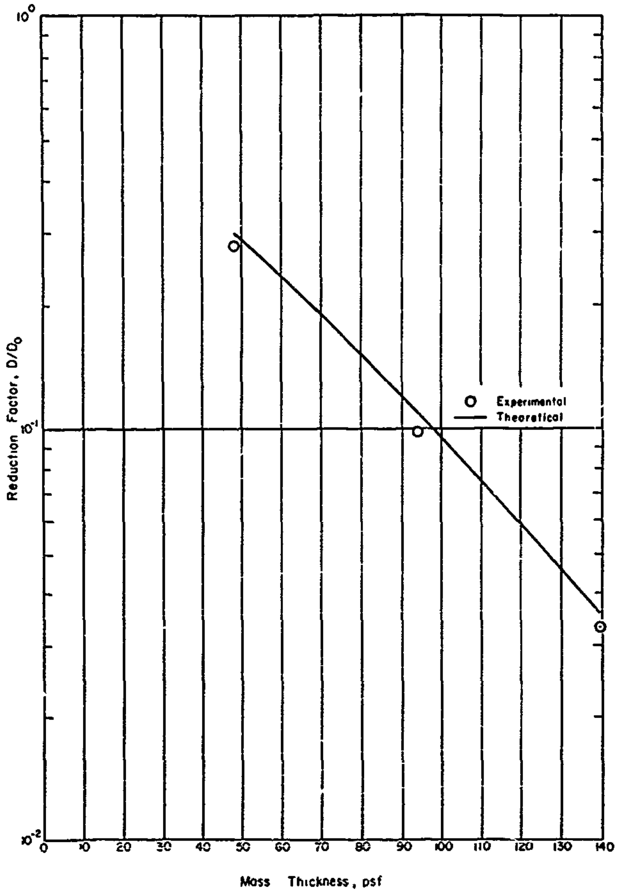


Figure 3.10 Experimental and theoretical reduction factors versus wall thickness at the 3-foot height in the center of the blockhouse. Source: Cobalt 60.

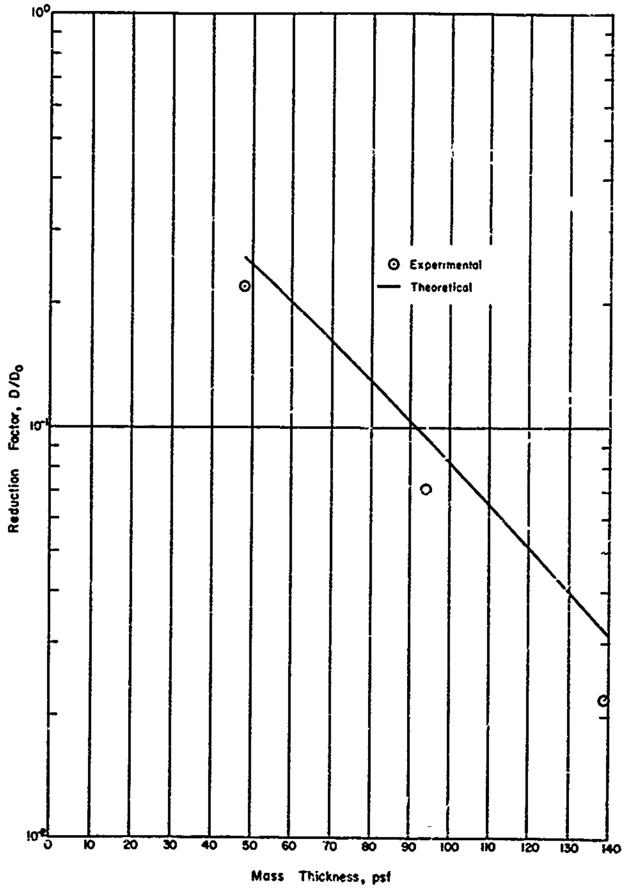


Figure 3.11 Experimental and theoretical reduction factors versus wall thickness at ground level in the center of the blockhouse. Source: Cobalt 60.

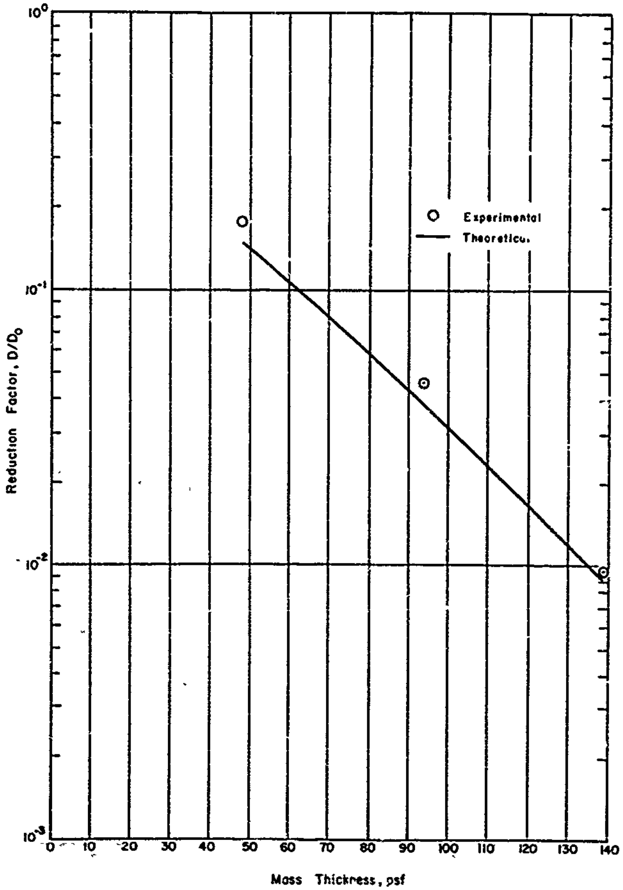


Figure 3.12 Experimental and theoretical reduction factors versus wall thickness at the 6-foot height in the center of the blockhouse. Source: Cesium 137.

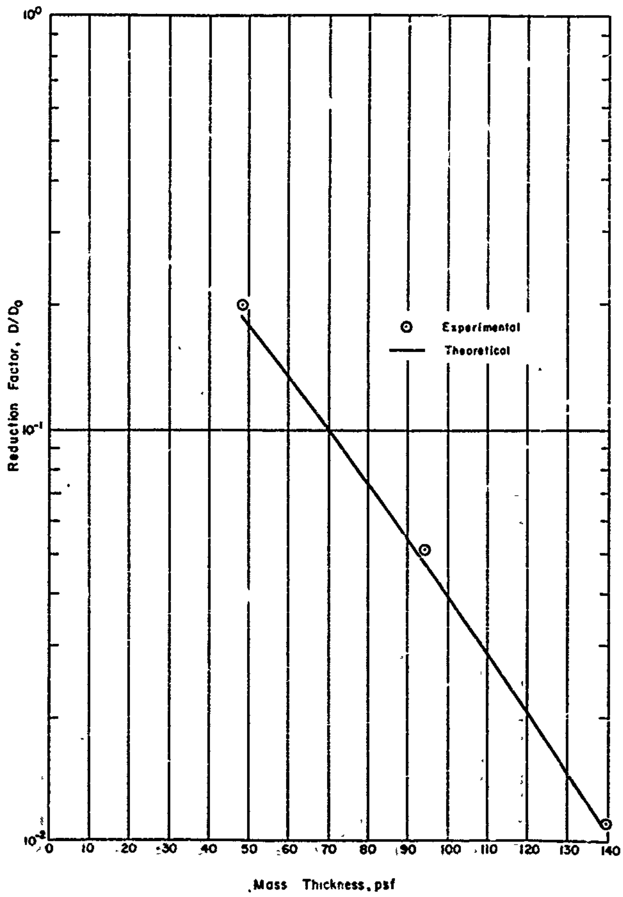


Figure 3.13 Experimental and theoretical reduction factors versus wall thickness at the 3-foot height in the center of the blockhouse. Source: Cesium 137.

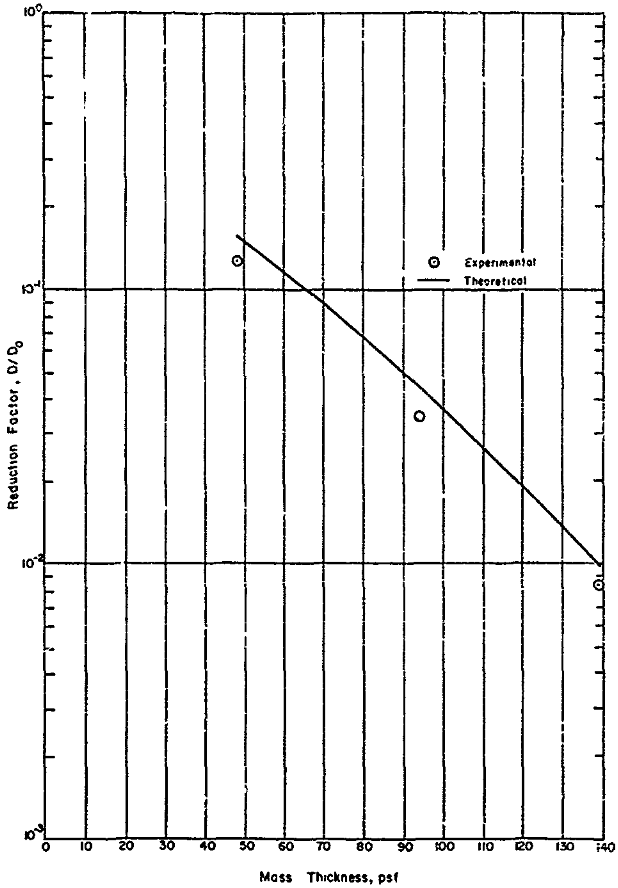


Figure 3.14 Experimental and theoretical reduction factors versus wall thickness at ground level in the center of the blockhouse. Source: Cesium 137.

CHAPTER 4

CONCLUSIONS

4.1 CONCLUSIONS

Experimental and theoretical reduction factors 3 feet and 6 feet above the center of the floor of the concrete blockhouse with wall thicknesses of 48, 93.7, and 139 psf agreed within ±15 percent for a uniform plane source of cobalt 60 and within ±20 percent for cesium 137.

Cobalt 60 and cesium 137 radiation show approximately exponential attenuation of dose rate as a function of wall thickness ranging from 48 to 139 psf for detector heights of 0, 3, and 6 feet.

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7. Rexroad, R. E. and Schmoke, M. A., NDL-TR-2, Scattered Radiation and Free Field Dose Rates from Distributed Cobalt 60 and Cesium 137 Sources. U. S. Army Chemical Corps Nuclear Defense Laboratory, Army Chemical Center, Maryland. September 1960. Unclassified.

APPENDIX

Experimental Point Source Data

The following pages contain the point source data for each wall thickness for the source positions shown in Figures 2.3 to 2.5 of this report. Also shown is the dose rate contribution from each row, obtained by converting the point source data to uniformly contaminated area source.

Special attention is called to the notation on Tables A4 through A6, listing the data for cesium 137. All cesium 137 data must be multiplied by the factor 0.924. This change resulted from a recalculation of the specific gamma exposure rate of 1 curie of cesium 137 in air. This recalculation was made by Dr. A. Foderaro of Pennsylvania State University while working under Nuclear Defense Laboratory Contract No. DA 18-108-AMC-24-A*.

The cesium 137 data shown on the tables were normalized on the basis of a specific dose rate of 0.39 (r/hr)/curie at one meter. The factor 0.924 is the ratio which converts the data to the recalculated value of 0.36 (r/hr)/curie, i.e.:

$$\frac{0.36\ (\text{r/hr})/\text{curie}}{0.39\ (\text{r/hr})/\text{curie}} = 0.924$$

Dr. Foderaro suggests that the value of 0.39 r/hr obtained from the National Bureau of Standards Handbook No. 54 does not take into account that only 92 percent of the cesium 137 disintegrations are accompanied by gamma rays; the remaining 8 percent are beta transitions to the ground state of the daughter.

All dose rates in the text of the report have been corrected by the above factor.

* Foderaro, A., Private Communication to R. E. Rexroad, 17 January 1963.

TABLE A 1 POINT SOURCE DATA AND CONVERSION TO AREA SOURCE RADIATION

Contaminant: Cobalt 60
Wall Thickness: 48 psf
Area of Simulated Unit: 4.46 ft^2

Detector Position	Source Positions (mr/hr)/curie																	Dose Rate Contribution Per Row (mr/hr)/(curie/ft^2)		
	#1	#2	#3	#5	#6	#7	#8	#10	#11	#12	#13	#14		#4	#9	#15		Row A	Row B	Row C
a_1	72.4	203.	247.	118.	203.	235.	183.	106.	138.	151.	124.	88.3		153.	105.	58.3				
a_2	43.3	45.8	64.2	35.6	34.8	32.4	6.76	28.7	30.1	28.0	6.34	39.7		4.72	5.54	5.51				
a_3	37.9	28.3	19.3	29.1	24.3	19.3	14.4	24.9	23.1	18.3	13.1	10.4		10.6	11.2	8.33				
a_4	39.4	11.9	4.91	60.3	29.2	15.9	9.98	70.2	40.7	25.0	14.6	9.61		4.67	5.32	6.15				
ΣA	193.	289.	335.	243.	291.	303.	214.	230.	232.	222.	158.	148.		173.	127.	78.3				
2(ΣA)	386.	578.	670.	486.	582.	606.	428.	460.	464.	444.	316.	296.				-		8,060	9,950	9,180
b_1	182.	184.	133.	116.	115.	97.2	64.3	84.5	82.4	72.7	52.8	39.7		66.1	43.6	30.5				
b_2	68.3	63.1	59.3	47.9	45.5	39.9	33.3	36.9	35.2	32.3	27.8	10.7		15.2	15.5	11.6				
b_3	57.5	44.2	31.4	44.1	36.1	27.3	21.5	33.7	30.8	27.0	19.8	13.9		20.2	16.1	12.0				
b_4	111	57.7	29.9	38.1	61.1	37.5	25.8	72.8	54.1	37.1	24.6	17.4		16.0	15.0	12.2				
ΣB	419.	349.	253.	296.	258.	202.	145.	228.	203.	169.	125.	81.7		118.	90.2	66.3				
2(ΣB)	838.	698.	506.	592.	516.	404.	290.	456.	406.	338.	250.	163.						9,630	8,430	7,490
C6'	64.5	53.1	42.6	53.9	47.8	39.0	30.9	45.9	40.0	32.7	26.9	19.0		26.7	22.5	16.4				
8(C6')	516.	425.	341.	431.	382.	312.	247.	367.0	320.	262.	215	152	4xC6'	214.	90.0	65.6		6,670	6,520	6,160
C3'	110	82.7	54.6	73.7	63.6	47.2	34.0	54.3	48.0	38.4	30.4	20.4		32.9	27.2	17.2				
8(C3')	880.	662.	437.	590.	509.	378.	272.	434.	384.	307.	243.	163.	4xC3'	132.	109.	68.8		9,420	8,290	7,140
C9'	126.	89.3	56.9	71.6	62.4	44.9	34.4	50.8	45.8	35.0	26.5	19.7		32.4	22.8	11.4				
8(C9')	1008.	714.	455.	573.	499.	359.	275.	406.	366.	280.	212.	158.	4xC9'	130.	91.2	45.6		10,300	8,010	6,550
d_1	188.	125.	62.2	120.	94.8	62.6	40.4	86.4	70.8	54.9	36.5	27.9		33.8	30.2	17.9				
d_2	107.	106.	90.6	71.6	70.4	63.3	47.6	52.5	49.9	45.8	34.0	22.0		32.3	26.5	17.9				
d_3	71.6	57.8	45.0	51.0	46.7	37.7	28.4	39.5	37.2	31.9	22.0	18.8		20.4	16.4	12.4				
d_4	82.8	52.3	34.8	60.8	47.9	33.0	25.7	47.8	37.7	33.0	23.0	14.7		21.9	17.7	11.9				
ΣD	449.	341.	233.	303.	260.	197.	142.	226.	196.	166.	116.	83.4		108.	90.8	60.1		9,610	8,450	7,290
2(ΣD)	898.	682.	466.	606.	520.	394.	284.	452.	392.	332.	232.	167.								
e_1'	144.	73.8	29.2	169.	116.	62.4	33.1	136.	109.	72.8	41.6	26.6		14.6	21.7	17.6				
e_2'	75.8	54.3	97.7	56.3	66.6	61.8	19.0	45.1	52.3	47.3	15.3	13.3		14.2	21.2	17.8				
e_3'	45.7	40.6	34.2	34.5	35.1	27.2	24.4	28.7	27.5	24.2	17.8	8.88		12.3	12.0	9.80				
e_4'	46.8	33.3	18.0	43.4	31.5	20.7	15.3	38.0	34.0	26.6	15.6	12.1		12.4	10.4	8.83		6,800	8,010	7,320
ΣE'	314.	242.	179.	303.	249.	172.	91.8	248.	223.	171.	90.3	60.9		53.5	65.3	54.0				
2(ΣE')	628.	484.	358.	606.	598.	344.	184.	496.	446.	342.	181.	122.								
f_1'	547.	170.	42.1	283.	173.	81.6	40.6	178.	128.	80.9	47.0	27.7		17.2	22.5	16.6				
f_2'	89.2	116.	125.	63.2	76.6	74.0	19.5	46.8	53.5	50.0	14.9	12.5		17.7	22.0	16.5				
f_3'	47.1	42.1	36.3	36.1	32.8	29.6	25.2	28.4	27.0	25.0	18.6	8.77		12.3	11.4	8.61				
f_4'	53.7	36.1	18.5	45.4	34.1	22.0	15.7	38.0	33.0	25.9	15.7	10.8		10.6	10.7	7.83		12,100	9,690	7,990
ΣF'	737.	364.	222.	428.	317.	207.	101.	291.	242.	182.	96.2	59.8		57.8	66.6	49.7				
2(ΣF')	1473.	728.	444.	856.	634.	414.	202.	582.	484.	364.	192.	120.								

TABLE A 1 (Continued)

Contaminant: Cobalt 60
Wall Thickness: 48 psf
Area of Simulated Unit: 17.8 ft^2

Source Positions (mr/hr)/curie

Dose Rate Contribution Per Row (mr/hr)/(curie/ft^2)

Detector Position	#16	#17	#18	#20	#21	#22	#23	#25	#26	#27	#28	#29		#19	#24	#30		Row D	Row E	Row F
a_1	64.4	66.6	46.7	33.6	34.7	27.2	20.0	21.2	21.3	18.5	14.8	11.0		26.8	14.1	7.94				
a_2	17.2	13.5	3.15	10.7	8.59	2.16	2.78	7.38	6.53	1.66	1.89	2.50		4.90	3.71	2.86				
a_3	14.0	10.2	7.45	9.59	7.73	5.95	4.30	6.87	5.82	4.65	3.92	2.87		4.71	3.18	2.38				
a_4	40.0	21.7	9.66	27.3	17.3	10.4	6.44	17.5	13.6	9.52	6.56	4.34		5.06	3.78	2.74				
ΣA	136.	112.	67.0	81.2	68.3	45.7	33.5	52.9	47.3	34.3	27.2	20.7		41.5	24.8	15.9				
2(ΣA)	272.	224.	134.	162.	137.	91.4	67.0	106.	94.6	68.6	54.4	41.4						12,000	8,580	7,240
b_1	46.1	39.0	24.6	24.6	21.7	17.1	12.1	15.7	14.6	12.5	9.74	7.12		14.8	8.01	5.24				
b_2	20.3	18.3	6.90	13.0	11.6	9.38	4.64	8.73	8.40	7.11	3.28	3.37		7.68	4.96	3.51				
b_3	20.0	15.1	9.79	12.8	10.2	7.64	5.19	8.73	7.91	6.25	4.73	3.72		6.59	4.21	2.88				
b_4	37.4	24.0	12.8	23.1	16.6	11.1	7.26	14.6	12.8	9.23	6.82	4.63		7.59	4.85	3.48				
ΣB	124.	96.0	54.1	73.5	60.1	45.2	29.2	47.8	43.1	35.1	24.6	18.8		36.7	22.0	15.1		10,000	7,800	6,300
2(ΣB)	248.	192.	108.	147.	120.	90.4	58.4	95.6	86.2	70.2	49.2	37.6								
C6'	27.8	22.0	14.5	16.5	13.5	10.8	7.57	11.5	9.61	8.01	6.37	4.69		9.60	5.80	3.96		9,490	7,050	5,800
8(C6')	222.	176.	116.	132.	108.	86.4	60.6	92.0	76.9	64.1	51.0	37.5		38.4	23.2	15.8				
C5'	29.1	23.0	14.5	17.4	14.4	11.1	7.61	11.3	10.2	8.56	6.82	5.03		9.70	5.64	3.89		9,840	7,330	6,040
8(C5')	233.	184.	116.	139.	115.	88.8	60.9	90.4	81.6	68.5	54.6	40.2		38.8	22.6	15.6				
C0'	25.9	20.4	12.5	14.9	12.1	9.09	6.58	8.97	8.70	6.52	5.19	3.33		7.81	3.98	1.67		8,620	6,140	4,610
8(C0')	207.	163.	100.	119.	96.8	72.7	52.6	71.8	69.6	52.2	41.5	26.6		31.2	15.9	6.68				
d_1	42.3	33.9	18.3	24.2	18.7	14.3	9.52	15.0	13.0	10.8	8.28	6.00		10.5	6.38	4.35				
d_2	30.1	26.4	17.8	17.3	15.3	12.2	6.52	11.5	10.5	9.35	7.45	4.46		10.9	6.37	4.43				
d_3	23.5	18.3	12.3	13.9	11.6	9.23	7.07	9.48	8.47	7.41	5.80	3.60		7.41	4.76	3.40				
d_4	26.2	19.2	11.2	15.7	12.7	9.13	6.43	10.2	9.28	7.35	5.56	4.14		7.03	4.35	3.16				
ΣD	122.	97.8	59.6	71.6	79.5	44.9	29.5	46.2	41.3	34.9	27.1	18.2		35.8	21.9	15.3		10,600	8,420	6,250
2(ΣD)	244.	196.	119.	143.	159.	89.8	59.0	92.4	82.6	69.8	54.2	36.4								
[illegible]	67.2	42.1	22.7	35.8	28.6	19.1	11.5	2.22	19.4	15.0	10.9	7.09		11.3	7.04	4.71				
[illegible]	30.4	25.9	8.24	17.7	15.1	5.00	6.35	11.2	10.5	3.58	3.92	4.73		9.71	6.94	5.05				
[illegible]	18.4	14.7	9.73	10.9	8.99	7.54	3.79	7.59	7.15	6.04	4.83	2.76		5.62	3.95	2.76				
[illegible]	23.4	14.9	8.88	15.1	11.5	8.04	5.38	10.0	8.68	6.87	5.19	3.53		5.60	3.79	2.84				
ΣE	139.	97.6	49.6	82.2	64.2	39.7	27.0	31.0	45.7	31.5	24.8	18.1		32.2	21.7	15.4		10,800	7,960	5,[illegible]
2(ΣE)	278.	195.	99.2	164.	128.	79.4	54.0	62.0	91.4	63.0	49.6	36.2								
[illegible]	72.1	45.5	21.5	35.7	26.6	17.1	10.6	2.10	17.7	13.7	9.42	6.26		10.4	6.35	4.35				
[illegible]	28.3	24.8	7.55	16.2	13.5	4.42	5.63	10.3	9.86	3.02	3.52	4.04		10.5	6.26	4.24				
[illegible]	42.3	13.8	9.69	10.0	8.20	6.85	3.30	6.92	6.32	5.27	4.41	2.40		5.17	2.25	2.34				
[illegible]	21.8	14.7	8.26	14.0	10.2	7.33	4.95	8.91	8.06	6.03	4.39	2.24		4.92	3.04	2.35				
[illegible]	165.	98.8	47.0	75.9	58.5	35.7	24.5	28.2	41.9	28.0	21.7	15.9		31.0	17.9	13.[illegible]		[illegible]1,600	[illegible],240	5,070
[illegible]	330.	198.	94.0	152.	117.	71.4	49.0	56.4	83.8	56.0	43.4	31.8								

TABLE A 1 (Continued)

Contaminant: Cobalt 60
Wall Thickness: 48 psf
Area of Simulated Unit: 71.3 ft^2

Detector Position	Source Positions (mr/hr)/curie #31	#32	#33	#35	#36	#37	#38	#40	#41	#42	#43	#44		#34	#39	#45		Dose Rate Contribution Per Row (mr/hr)/(curie/ft^2) Row G	Row H	Row I
a_1	11.8	10.1	7.05	7.87	6.07	4.56	3.39	3.99	3.73	3.19	2.81	1.92		4.51	2.43	1.35				
a_2	4.59	1.15	1.62	3.05	.758	8.43	1.11	1.93	.520	.527	.714	.822		2.05	1.32	.914				
a_3	4.56	3.31	2.47	3.80	2.39	1.84	1.40	2.02	1.70	2.10	1.19	.802		1.50	.950	.641				
a_4	10.3	6.47	3.89	6.57	4.69	3.25	2.14	3.92	3.21	2.49	1.87	1.29		2.14	1.40	.929				
ΣA	31.2	22.1	15.0	20.1	13.9	18.1	8.04	11.7	9.16	3.31	6.58	3.67		10.2	6.10	3.83				
2(ΣA)	62.4	42.2	30.0	40.2	27.8	36.2	16.1	23.4	18.3	16.6	13.2	7.34						10,300	8,980	5,900
b_1	3.26	7.41	5.19	6.03	4.88	3.49	2.63	3.12	3.17	2.63	2.06	1.51		3.11	1.80	1.17				
b_2	5.42	4.66	2.23	3.73	3.13	1.30	1.39	2.20	2.14	1.76	.934	.907		2.25	1.39	.933				
b_3	5.57	[illegible]	2.96	3.75	2.82	2.20	1.63	2.26	2.09	2.42	1.26	1.01		1.88	1.14	.748				
b_4	8.20	6.11	3.82	5.63	4.11	3.00	2.06	3.32	2.79	2.15	1.71	1.21		2.24	1.39	.908				
ΣB	28.5	22.4	14.2	19.1	14.9	9.99	7.71	11.2	10.2	8.96	5.96	4.64		9.48	5.72	3.76				
2(ΣB)	47.0	44.8	28.4	38.2	29.8	20.0	15.4	22.4	20.4	17.9	11.9	9.28						9,270	7,770	6,110
C6°	7.16	3.21	3.70	4.46	3.54	2.68	2.01	1.64	2.38	2.00	1.63	1.22		2.47	1.51	.968				
8(C6°)	96.8	41.7	29.6	35.7	28.3	21.4	16.1	13.1	19.0	16.0	13.0	9.76	4xC6'	9.88	6.04	3.87		9,840	7,700	5,330
C3°	7.00	5.54	3.79	4.78	3.72	2.80	2.03	2.73	2.47	2.07	1.64	1.20		2.40	1.42	.948				
8(C3°)	56.0	44.3	30.3	38.2	29.8	22.4	16.2	21.8	19.8	16.6	13.2	9.60	4xC3'	9.60	5.68	3.79		9,980	7,990	6,050
C0°	5.96	4.34	2.81	3.74	2.96	1.97	.971	1.97	1.90	1.51	1.01	.482		1.16	.801	.491				
8(C0°)	47.7	34.7	22.5	29.9	23.7	15.8	7.77	15.8	15.2	12.1	8.08	3.86	4xC0'	4.64	3.20	1.96		7,840	5,730	4,060
d_1	8.82	6.66	4.37	5.76	4.33	3.32	2.23	3.24	2.90	2.44	1.95	1.34		2.67	1.61	1.05				
d_2	6.97	5.75	2.90	4.49	3.92	2.91	1.63	2.72	2.55	2.17	1.55	1.06		2.80	1.61	1.07				
d_3	5.87	5.06	3.27	4.07	3.19	2.33	1.45	2.44	2.28	1.94	1.49	.901		2.22	1.37	.880				
d_4	6.43	4.88	3.23	4.40	3.47	2.43	1.85	2.63	2.35	1.91	1.50	1.10		2.24	1.31	.839				
ΣD	28.1	22.1	13.8	18.7	14.9	11.0	7.16	11.0	10.1	8.46	6.49	4.40		9.93	5.90	3.84				
2(ΣD)	56.2	44.2	27.4	37.4	29.8	22.0	14.3	22.0	20.2	16.9	13.0	8.80						9,840	7,770	6,040
[illegible]	12.5	1.58	5.67	4.27	6.10	4.35	2.95	4.41	3.99	3.25	2.44	1.72		3.09	1.83	1.21				
[illegible]	7.06	2.30	2.95	7.47	1.63	1.48	1.74	2.79	2.19	.945	1.13	1.18		3.04	1.83	1.19				
[illegible]	4.76	4.03	1.86	3.37	2.83	2.11	1.41	2.21	1.70	1.59	.822	.812		1.93	1.22	.784				
[illegible]	6.18	4.54	3.12	4.61	3.47	2.37	1.68	2.83	2.52	2.81	1.48	1.04		1.95	1.22	.822				
[illegible]	30.5	12.5	13.6	19.7	14.0	10.3	7.78	12.2	10.4	8.60	5.87	4.75		10.0	6.10	4.01				
[illegible]	61.0	25.0	27.2	39.4	28.0	20.6	15.6	24.4	20.8	17.2	11.7	9.50						8,770	7,990	6,250
[illegible]	11.5	8.00	4.81	7.25	5.49	3.72	2.50	4.18	3.58	2.84	2.09	1.45		2.70	1.63	1.02				
[illegible]	6.33	2.00	2.54	4.18	1.41	1.25	1.55	2.38	2.07	.839	.970	1.00		2.77	1.63	1.07				
[illegible]	4.46	3.71	1.63	3.15	2.52	1.97	1.04	1.93	2.03	1.39	.709	.674		1.65	1.05	.694				
[illegible]	5.70	4.17	2.65	3.96	3.04	2.16	1.45	2.45	2.03	2.52	1.28	.894		1.61	1.04	.687				
[illegible]	28.0	17.9	11.6	18.5	12.5	9.10	6.54	10.9	9.71	7.59	5.05	4.02		8.73	5.35	3.47				
[illegible]	56.0	35.8	23.2	37.0	25.0	18.2	13.1	21.8	19.4	15.2	10.1	8.04						8,840	7,040	5,560

TABLE A1 (Continued)

Contaminant: Cobalt 60
Wall Thickness: 48 psf
Area of Simulated Unit: 285 ft^2

Detector Position	Source Positions (mr/hr)/curie #46	#47	#48	#50	#51	#52	#53	#55	#56	#57	#58	#59		#49	#54	#60		Dose Rate Contribution Per Row (mr/hr)/(curie/ft^2) Row J	Row K	Row L
A1	2.36	1.90	1.31	1.35	1.19	.859	.654	.861	.849	.658	.518	.370		.881	.455	.296				
A2	1.17	.336	.515	.646	.216	.258	.360	.435	.136	.156	.199	.212		.589	.333	.220				
A3	1.26	.966	.668	.728	.648	.456	.348	.499	.455	.371	.298	.200		.392	.220	.144				
A4	2.30	1.61	1.05	1.35	1.06	.777	.514	.861	.743	.594	.454	.304		.586	.321	.224				
ΣA	7.09	4.81	2.60	4.07	3.11	2.35	1.88	2.68	2.18	1.78	1.47	1.09		2.45	1.33	.884				
2(ΣA)	14.2	9.62	5.20	8.14	6.22	4.70	3.76	5.36	4.36	3.56	2.94	2.18						8,270	6,900	5,500
B1	1.98	1.60	1.10	1.14	1.04	.740	.530	.741	.701	.564	.441	.301		.686	.369	.240				
B2	1.46	1.10	.571	.859	.783	.323	.347	.555	.501	.313	.223	.218		.565	.308	.207				
B3	1.41	1.07	.746	.883	.707	.570	.399	.547	.515	.412	.333	.233		.444	.244	.163				
B4	1.99	1.41	.865	1.17	.950	.743	.472	.740	.672	.530	.429	.262		.559	.297	.190				
ΣB	6.77	5.18	3.20	4.05	3.48	2.38	1.75	2.58	2.39	1.82	1.43	1.03		2.25	1.22	.800				
2(ΣB)	13.5	10.4	6.40	8.10	6.96	4.76	3.50	5.16	4.78	3.64	2.86	2.06						9,290	6,980	5,500
C6'	1.53	1.21	.868	.920	.818	.604	.443	.596	.541	.454	.360	.259		.596	.319	.208				
8(C6')	12.2	9.68	6.94	7.36	6.54	4.83	3.54	4.77	4.33	3.63	2.88	2.07	4xC6'	2.38	1.28	.832		8,890	6,730	5,270
C3'	1.65	1.29	.870	.991	.985	.654	.494	.669	.594	.504	.375	.261		.554	.320	.205				
8(C3')	13.2	10.3	6.96	7.93	7.88	5.23	3.95	5.35	4.75	4.03	3.00	2.09	4xC3'	2.22	1.28	.820		9,320	7,500	5,700
C0'	1.10	.751	.506	.642	.563	.372	.280	.492	.454	.306	.277	.186		.322	.191	.125				
8(C0')	8.80	6.01	4.05	5.14	4.50	2.98	2.24	3.94	3.63	2.45	2.22	1.49	4xC0'	1.29	.764	.500		5,760	4,450	4,050
D1	1.93	1.49	.995	1.17	.962	.738	.485	.759	.676	.548	.432	.283		.640	.336	.220				
D2	1.64	1.32	.700	.965	.847	.620	.385	.605	.594	.479	.276	.235		.650	.341	.221				
D3	1.50	1.20	.806	.896	.781	.636	.342	.576	.550	.462	.352	.217		.558	.300	.198				
D4	1.61	1.23	.775	.965	.798	.589	.425	.646	.568	.459	.358	.247		.518	.276	.189				
ΣD	6.68	5.24	3.28	4.00	3.39	2.58	1.64	2.59	2.39	1.95	1.42	.973		2.37	1.25	.828				
2(ΣD)	13.4	10.5	6.56	8.00	6.78	5.16	3.28	5.18	4.78	3.90	2.84	1.95						9,350	6,980	5,560
E4'	2.55	1.94	1.28	1.44	1.20	.920	.640	.916	.860	.696	.537	.364		.732	.356	.257				
E4'	1.63	.565	.655	.947	.329	.373	.420	.606	.220	.239	.270	.251		.720	.358	.261				
E4'	1.31	1.06	.516	.824	.716	.512	.317	.570	.497	.411	.214	.193		.488	.279	.173				
E4'	1.71	1.23	.823	1.00	.866	.606	.382	.672	.589	.488	.372	.243		.521	.287	.185				
ΣE4'	7.20	4.80	3.27	4.21	3.11	2.41	1.76	2.76	2.17	1.84	1.39	1.05		2.46	1.36	.876				
2(ΣE4')	14.4	9.60	6.54	8.42	6.22	4.82	3.52	5.52	4.34	3.68	2.78	2.10						9,320	6,210	4,870
F2'	2.34	1.73	1.10	1.36	1.13	.789	.541	.871	.784	.624	.462	.311		.640	.357	.226				
F2'	1.44	.489	.630	.846	.288	.325	.363	.547	.196	.206	.242	.236		.647	.352	.233				
F2'	2.16	.917	.451	.735	.651	.485	.268	.488	.431	.352	.183	.213		.431	.244	.162				
F2'	1.43	1.10	.727	.883	.728	.530	.370	.580	.508	.436	.332	.217		.443	.245	.164				
ΣF2'	6.37	4.24	2.91	3.82	2.80	2.13	1.54	2.49	1.92	1.62	1.22	.917		2.16	1.20	.783				
2(ΣF2')	12.7	8.48	5.82	7.64	5.60	4.26	3.08	4.38	3.84	3.24	2.44	1.81								

TABLE A 1 (Continued)

Contaminant: Cobalt 60
Wall Thickness: 48 psf
Area of Simulated Unit: 1140 ft²

Detector Position	#61	#62	#63	#65	#66	#67	#68	#70	#71	#72	#73	#74		#64	#69	#75		Row M	Row N	Row O
								Source Positions (mr/hr)/curie										Dose Rate Contributions Per Row (mr/hr)/(curie/ft²)		
a1	.487	.378	.261	.282	.254	.192	.141	.172	.158	.129	.0993	.0811		.184	.0992	.0582				
a2	.154	.0940	.129	.149	.0549	.0712	.0759	.0950	.0310	.0407	.0490	.0490		.138	.0765	.0493				
a3	.287	.238	.161	.174	.165	.107	.0819	.111	.103	.0830	.0676	.0483		.100	.0539	.0359				
a4	.486	.327	.237	.277	.246	.178	.121	.173	.149	.127	.0924	.0719		.142	.0770	.0501				
ΣA	1.41	1.67	.788	.882	.720	.548	.420	.551	.441	.380	.308	.250		.564	.307	.194				
2(ΣA)	2.82	2.14	1.58	1.76	1.44	1.10	.840	1.10	.882	.760	.616	.500						8,090	6,210	4,620
b1	.399	.346	.223	.236	.225	.157	.116	.155	.141	.119	.0866	.0683		.146	.0822	.0485				
b2	.331	.250	.136	.201	.170	.0806	.0803	.127	.111	.0522	.0486	.0495		.132	.0714	.0486				
b3	.346	.235	.177	.193	.178	.134	.0945	.123	.118	.0897	.0708	.0528		.111	.0634	.0391				
b4	.424	.336	.225	.247	.218	.159	.114	.156	.141	.114	.0893	.0675		.134	.0749	.0470				
ΣB	1.50	1.17	.761	.877	.791	.531	.405	.561	.511	.375	.295	.238		.523	.292	.183				
2(ΣB)	3.00	2.34	1.52	1.74	1.58	1.06	.810	1.12	1.02	.750	.580	.476						8,410	6,250	4,710
C6'	.332	.273	.199	.196	.184	.146	.110	.122	.113	.0952	.0735	.0631		.147	.0473	.0479				
8(C6')	2.66	2.15	1.59	1.57	1.47	1.17	.880	.976	.904	.762	.588	.505	4xC6'	.588	.189	.192		7,930	6,130	4,480
C3'	.374	[illegible]	.189	.225	.200	.152	.106	.142	.121	.100	.0764	.0608		.132	.0732	.0437				
8(C3')	2.99	2.33	1.51	1.80	1.60	1.22	.848	1.14	.968	.800	.611	.486	4xC3'	.528	.293	.175		8,390	6,570	4,570
C0'	.295	.218	.134	.173	.147	.0931	.0644	.111	.0992	.0723	.0496	.0376		.0918	.0485	.0371				
8(C0')	2.36	1.74	1.07	1.46	1.18	.745	.515	.888	.794	.578	.397	.301	4xC0'	.367	.194	.148		6,320	4,660	3,550
d1	.440	.336	.225	.257	.224	.157	.110	.161	.142	.110	.0898	.0639		.143	.0798	.0497				
d2	.272	.281	.153	.211	.183	.132	.0868	.132	.119	.0976	.0555	.0526		.144	.0773	.0475				
d3	.345	.220	.131	.211	.187	.129	.0719	.136	.117	.0897	.0667	.0450		.121	.0673	.0451				
d4	.354	.232	.189	.211	.197	.167	.0971	.138	.127	.106	.0761	.0580		.124	.0683	.0442				
ΣD	1.41	1.19	.758	.890	.791	.585	.366	.557	.505	.403	.288	.220		.537	.293	.188				
2(ΣD)	2.82	2.38	1.51	1.78	1.58	1.17	.732	1.01	1.01	.806	.576	.440						8,270	6,340	4,590
[illegible]	.517	.423	.283	.269	.278	.195	.134	.188	.170	.140	.107	.0762		.157	.0960	.0573				
[illegible]	.345	.140	.164	.202	.0799	.0872	.0913	.129	.0507	.0526	.0582	.0579		.156	.0865	.0509				
[illegible]	.312	.240	.129	.188	.170	.117	.0789	.125	.100	.0824	.0494	.0480		.117	.0682	.0421				
[illegible]	.376	.297	.188	.227	.197	.149	.0971	.142	.122	.103	.0771	.0569		.116	.0627	.0409				
[illegible]	1.55	1.10	.764	.886	.725	.548	.401	.584	.443	.378	.292	.239		.536	.318	.191				
[illegible]	3.10	2.20	1.43	1.77	1.45	1.10	.802	1.17	.886	.656	.584	.478						8,290	6,200	4,530
E2'	.490	.374	.242	.295	.252	.169	.116	.177	.151	.127	.0939	.0674		.140	.0817	.0500				
[illegible]	.311	.117	.153	.183	.0717	.0844	.0871	.119	.0431	.0489	.0508	.0523		.148	.0773	.0460				
[illegible]	.285	.216	.114	.171	.163	.110	.0680	.112	.0967	.0871	.0412	.0424		.110	.0585	.0381				
[illegible]	.345	.273	.173	.205	.177	.133	.110	.125	.105	.0995	.0722	.0547		.112	.0608	.0404				
[illegible]	1.42	.980	.682	.854	.663	.496	.381	.914	.396	.363	.258	.216		1.51	.278	.175				
[illegible]	2.84	1.96	1.36	1.71	1.33	.992	.762	1.83	.792	.726	.516	.432						8,740	5,780	5,100

TABLE A 1 (Continued)

Contaminant: Cobalt 60
Wall Thickness: 48 psf
Area of Simulated Unit: 4560 ft²

SOURCE POSITIONS (mr/hr)/curie

Dose Rate Contribution Per Row (mr/hr)/(curie/ft²)

Detector Position	#76	#77	#78	#80	#81	#82	#83	#85	#86	#87	#88	#89		#79	#84	#90		Row P	Row Q	Row R
[illegible]	.0957	.0742	.0501	.0521	.0451	.0347	.0256	.0172			.0105			.0332	.0177					
[illegible]	.0808	.0807	.0559	.0159	.0117	.0144	.0155	.00903			.00521			.0264	.0144					
[illegible]	.0832	.0501	.0360	.0366	.0308	.0203	.0167	.0113			.00713			.0182	.00985					
[illegible]	.0962	.0485	.0377	.0428	.0351	.0276	.0191	.0140			.00634			.0241	.0133					
[illegible]	.470	.204	.149	.150	.123	.0970	.0769	.0518			.0312			.102	.0553					
[illegible]	.940	.408	.298	.300	.246	.194	.154	.104			.0624									
																		6,160	4,330	
[illegible]	.0821	.0662	.0435	.0437	.0409	.0300	.0213	.0149			.00887			.0264	.0144					
[illegible]	.0650	.0426	.0281	.0361	.0321	.0141	.0152	.0133			.00572			.0265	.0137					
[illegible]	.0772	.0538	.0347	.0378	.0353	.0244	.0176	.0129			.00749			.0204	.0124					
[illegible]	.0879	.0696	.0435	.0470	.0424	.0325	.0224	.0162			.00898			.0242	.0128					
[illegible]	.323	.232	.150	.165	.151	.101	.0765	.0573			.0311			.0975	.0533					
Σ(ΣA)	.646	.464	.300	.330	.302	.202	.153	.115			.0622									
																		6,790	4,740	
C6°	.0715	.0544	.0391	.0391	.0380	.0272	.0177	.0118	.0106	.00930	.00773	.00641		.0248	.0128	.00521				
Σ(C6°)	.572	.435	.313	.313	.256	.218	.142	.0944	.0848	.0744	.0618	.0573	4 x C6¹	.0992	.0512	.0208		6,480	4,470	1,770
C3°	.0798	.0583	.0460	.0428	.0366	.0286	.0207	.0142	.0128	.0110	.00875	.00692		.0251	.0129	.00539				
Σ(C3°)	.639	.466	.320	.342	.293	.229	.166	.114	.102	.0880	.0700	.0554	4 x C3¹	.100	.0516	.0216		6,930	4,920	2,060
C0°	.0585	.0443	.0272	.0317	.0283	.0209	.0146	.0111	.00975	.00810	.00618	.00472		.0167	.00999	.00347				
Σ(C0°)	.468	.354	.217	.254	.226	.167	.117	.0888	.0780	.0649	.0494	.0378	4 x Co¹	.0668	.0400	.0139		5,060	3,670	1,520
D1	.0846	.0621	.0417	.0463	.0384	.0315	.0203	.0164			.00960			.0261	.0155					
[illegible]	.0739	.0598	.0302	.0395	.0361	.0264	.0164	.0145			.00677			.0256	.0141					
[illegible]	.0636	.0552	.0332	.0374	.0321	.0203	.0140	.0129			.00761			.0226	.0120					
[illegible]	.0762	.0609	.0379	.0428	.0367	.0275	.0182	.0139			.00832			.0222	.0114					
[illegible]	.297	.237	.143	.166	.143	.106	.0689	.0577			.0323			.0965	.0530					
Σ(ΣD)	.594	.474	.286	.332	.286	.212	.138	.115			.0646									
																		6,610	4,650	
[illegible]	.0985	.0739	.0500	.0519	.0440	.0351	.0240	.0188			.0112			.0303	.0152					
[illegible]	.0646	.0300	.0513	.0380	.0164	.0188	.0182	.0123			.00630			.0287	.0163					
[illegible]	.0997	.0506	.0246	.0364	.0295	.0212	.0150	.0123			.00527			.0218	.0115					
[illegible]	.0845	.0585	.0271	.0428	.0351	.0276	.0191	.0140			.00834			.0241	.0133					
[illegible]	.305	.213	.143	.169	.125	.103	.0763	.0574			.0311			.105	.0563					
[illegible]	.610	.426	.286	.338	.250	.206	.153	.115			.0622									
																		6,520	4,560	
[illegible]	.0819	.0711	.0442	.0497	.0425	.0289	.0221	.0174			.0163			.0260	.0140					
[illegible]	.0998	.0456	.0259	.0329	.0146	.0160	.0158	.0110			.00533			.0250	.0141					
[illegible]	.0687	.0468	.0250	.0324	.0318	.0218	.0136	.0114			.00539			.0204	.0136					
[illegible]	.0785	.0577	.0352	.0390	.0345	.0261	.0179	.0135			.00734			.0215	.0123					
[illegible]	.287	.201	.233	.154	.123	.0988	.0694	.0533			.0281			.0929	.0540					
[illegible]	.574	.402	.466	.363	.246	.186	.139	.107			.0562							6,060	4,250	

TABLE A.2 POINT SOURCE DATA AND CONVERSION TO AREA SOURCE RADIATION

Contamination: Cobalt 60
Wall Thickness: 93.7 psf
Area of Contaminated Unit: 4.[illegible] ft²

Detector Position	#1	#2	#3	#5	#6	#7	#8	#10	#11	#12	#13	#14		#4	#9	#15		Row A	Row B	Row C
	SOURCE POSITIONS (mr/hr)/curie																	Dose Rate Contribution Per Row (mr/hr)/(curie/ft²)		
[illegible]	14.1	61.8	54.3	32.6	71.3	76.5	49.4	29.8	38.4	47.4	35.7	22.5		36.8	25.1	14.1				
[illegible]	15.5	17.7	18.1	11.4	11.4	9.21	2.73	8.13	8.19	7.49	2.67	1.33		.979	1.26	1.20				
[illegible]	12.5	9.60	2.46	9.11	6.82	4.61	4.12	6.86	5.52	4.31	3.69	2.62		3.37	2.34	2.09				
[illegible]	6.30	2.25	1.41	14.7	6.59	2.48	1.09	18.3	8.95	4.49	2.59	1.57		.766	1.10	1.18				
[illegible]	52.2	[illegible]	111.	67.8	96.1	93.0	57.3	63.0	61.4	63.7	44.7	27.8		41.9	29.8	18.6				
[illegible]	104.	133.	222.	136.	192.	186.	115.	126.	123.	127.	89.4	55.6						2,720	3,260	2,670
[illegible]	62.2	68.8	46.7	39.5	35.8	29.3	18.0	26.1	25.2	21.9	13.8	9.24		18.9	9.96	6.35				
[illegible]	23.6	26.3	21.3	15.6	14.4	12.2	7.53	11.6	10.9	10.1	7.09	3.01		3.32	3.21	3.08				
[illegible]	20.2	15.3	10.8	14.1	10.8	7.19	4.56	11.5	8.73	6.95	5.44	3.52		4.96	3.32	2.81				
[illegible]	38.6	16.9	2.99	30.7	16.7	7.85	4.33	2.24	14.3	9.60	4.99	3.81		2.99	3.01	2.57				
[illegible]	143.	127.	34.8	99.9	77.7	56.5	34.4	51.4	59.1	48.6	31.3	19.6		30.2	19.5	14.8				
[illegible]	286.	254.	154.	200.	155.	113.	68.6	103.	118.	97.2	62.6	39.2						3,630	2,750	2,150
[illegible]	20.9	17.9	12.0	18.5	15.1	9.68	6.33	14.6	12.1	10.3	7.19	4.58		5.94	4.42	3.38				
[illegible]	167.	143.	36.0	148.	121.	77.4	50.6	117.	96.8	82.4	57.5	36.6	4 x C6'	23.8	17.7	13.5		2,120	2,050	2,000
[illegible]	40.8	34.3	18.5	24.8	18.8	13.0	7.54	18.2	14.1	11.4	7.52	4.97		9.31	5.14	3.66				
[illegible]	326.	274.	148.	198.	150.	104.	60.3	146.	113.	91.2	60.2	39.8	4 x C3'	37.2	20.6	14.6		3,880	2,630	2,300
[illegible]	41.9	33.7	18.9	22.9	17.9	11.6	7.12	15.7	11.3	9.39	6.95	4.28		8.84	4.54	3.56				
[illegible]	335.	270.	151.	183.	143.	92.8	57.0	126.	90.4	75.1	55.6	34.2	4 x C0'	35.4	18.2	14.2		3,910	2,440	1,960
[illegible]	67.2	45.2	19.2	42.1	25.9	17.0	8.75	26.6	22.0	15.1	8.63	5.59		7.93	4.62	3.67				
[illegible]	37.3	43.4	32.8	23.7	21.4	17.9	11.7	16.7	15.1	13.6	10.1	4.91		7.82	5.01	3.67				
[illegible]	25.7	23.3	14.5	16.5	13.7	10.0	6.82	12.1	11.2	8.87	5.09	4.00		4.50	3.47	3.00				
[illegible]	28.6	17.9	10.5	20.0	12.9	8.23	4.25	16.4	11.0	7.91	4.89	3.93		4.73	3.29	2.78				
[illegible]	159.	130.	77.0	102.	73.9	53.1	31.5	71.8	59.3	45.5	28.7	18.4		25.0	16.4	13.1				
[illegible]	318.	260.	154.	204.	148.	106.	63.0	144.	119.	91.0	57.4	36.8						3,740	2,650	1,750
[illegible]	41.1	13.1	7.54	56.3	33.7	14.0	6.14	42.7	31.4	18.6	8.89	5.19		3.10	3.65	3.32				
[illegible]	22.4	33.1	38.6	19.4	21.5	18.7	5.17	14.8	15.2	14.0	4.95	3.43		3.45	3.47	3.08				
[illegible]	18.3	15.3	12.4	12.0	10.5	7.95	5.37	9.56	7.76	7.08	5.96	2.29		2.39	2.67	2.06				
[illegible]	16.0	8.33	4.78	13.3	8.50	4.72	3.45	11.3	7.78	5.09	4.01	2.73		2.49	2.48	2.03				
[illegible]	97.8	74.8	59.3	101.	74.2	45.4	20.1	78.4	62.1	44.8	23.8	13.6		11.4	12.3	10.5				
[illegible]	196.	150.	119.	202.	148.	90.8	40.2	157.	124.	89.6	47.6	27.2						2,350	2,440	2,250
[illegible]	87.6	34.7	9.10	71.6	36.9	17.5	6.44	48.4	32.8	19.3	8.98	5.27		3.64	3.54	3.27				
[illegible]	25.6	41.2	12.9	20.3	21.8	21.4	5.30	14.8	15.5	14.2	4.93	3.44		3.82	3.67	3.08				
[illegible]	17.6	15.8	13.2	12.0	10.0	7.93	5.60	8.99	7.84	7.15	5.89	2.43		2.49	2.53	2.02				
[illegible]	18.6	9.37	5.22	13.6	7.76	4.69	2.87	11.1	7.63	4.96	3.83	2.65		2.41	2.36	2.09				
[illegible]	149.	101.	72.4	118.	76.5	51.5	20.2	83.3	63.8	45.6	23.6	13.8		12.4	12.1	10.5				
[illegible]	298.	202.	141.	236.	153.	103.	40.4	167.	128.	91.2	47.2	27.6						3,230	2,690	2,330

TABLE A 2 (Continued)

Contaminant: Cobalt 60
Wall Thickness: 93.7 psf
Area of Contaminated Unit: 19.7 ft²

Detector Position	SOURCE POSITIONS (mr/hr)/curie 16	17	18	20	21	22	23	25	26	27	28	29		19	24	30		Dose Rate Contribution Per Row (mr/hr)/(curie/ft²) Row D	Row E	Row F
a1	21.1	23.7	13.6	12.5	12.2	8.65	5.92	7.42	7.37	6.20	4.42	3.32		7.27	4.01	2.30				
a2	7.16	5.16	.951	3.81	2.88	.814	.633	2.83	2.00	.681	.472	.549		.975	.795	.604				
a3	6.00	3.70	1.86	3.77	2.60	1.76	1.11	2.61	2.22	1.54	1.02	.735		1.30	.922	.589				
a4	12.2	5.06	1.90	8.50	5.05	2.44	1.41	6.31	4.43	2.75	1.62	.999		.910	.860	.612				
Σa	46.5	37.6	18.3	28.6	22.7	13.7	9.07	19.2	16.0	11.2	7.53	5.60		10.5	6.59	4.11				
2(Σa)	93.0	75.2	36.6	57.2	45.4	27.4	18.1	38.4	32.0	22.4	15.1	11.2								
																		4,240	3,050	2,340
b1	16.1	12.2	6.53	8.74	7.58	4.99	3.48	5.88	5.17	4.10	3.01	2.04		4.24	2.30	1.50				
b2	7.19	5.92	2.10	4.87	4.44	2.82	1.18	3.25	3.16	2.30	.921	.814		1.81	1.19	.864				
b3	6.96	4.78	2.36	4.89	3.56	2.21	1.45	3.27	2.68	2.05	1.36	1.01		1.70	1.07	.728				
b4	12.0	6.84	3.23	7.88	5.47	3.31	1.88	5.51	4.17	2.99	1.91	1.22		1.69	1.16	.819				
Σb	42.2	29.7	14.6	26.4	21.1	13.3	7.99	17.9	15.2	11.4	7.20	5.08		9.44	5.72	3.91				
2(Σb)	84.4	59.4	29.2	52.8	42.2	26.6	16.0	35.8	30.4	22.8	14.4	10.2								
																		3,590	2,820	2,320
C6'	8.81	6.85	3.90	6.28	4.88	3.39	2.17	4.30	3.60	2.75	1.93	1.43		2.39	1.61	1.05				
8(C6')	70.5	54.8	31.2	50.2	39.0	27.1	17.4	34.4	28.8	22.0	15.4	11.4	4 x C6'	9.56	6.44	4.20		3,270	2,760	2,290
C3'	10.4	6.95	4.12	6.41	5.05	3.68	2.29	4.37	3.67	2.99	1.96	1.36		2.43	1.55	1.01				
8(C3')	83.2	55.6	33.0	51.3	40.4	29.4	18.3	35.0	29.4	23.9	15.7	10.9	4 x C3'	9.72	6.20	4.04		3,590	2,880	2,340
C0'	8.02	6.34	3.22	5.22	4.30	2.25	1.61	2.77	2.85	1.83	1.02	.691		1.85	.739	.521				
8(C0')	64.2	40.7	25.8	41.8	34.4	18.0	12.9	22.2	22.8	14.6	8.16	5.53	4 x C0'	7.40	2.96	2.08		2,500	2,200	1,490
D1	14.1	9.60	4.81	8.29	6.24	4.17	2.66	5.53	4.62	3.62	2.48	1.60		2.56	1.66	1.13				
d2	10.3	8.33	4.76	6.46	5.20	3.71	1.80	4.63	4.13	3.14	2.19	1.19		2.83	1.69	1.13				
d3	7.92	5.95	3.33	5.24	4.23	2.65	1.79	2.71	3.01	2.33	1.59	.881		1.80	1.19	.818				
d4	8.48	5.72	2.99	6.10	4.39	2.76	1.73	4.06	3.33	2.38	1.62	1.12		1.71	1.10	.783				
ΣD	40.8	29.6	15.9	26.1	20.1	13.3	7.98	16.9	15.1	11.5	7.88	4.79		8.90	5.64	3.86				
2(ΣD)	81.6	59.2	31.8	52.2	40.2	26.6	16.0	33.8	30.2	23.0	15.8	9.58								
																		3,590	2,780	2,290
E1	21.2	12.0	5.40	13.1	8.55	5.15	2.81	7.70	6.55	4.83	2.88	1.74		2.40	1.61	1.14				
e2	10.4	7.68	2.33	6.08	5.00	1.79	1.43	4.24	3.60	1.49	1.05	1.07		2.54	1.66	1.13				
e3	6.43	4.39	2.72	4.13	3.33	2.30	1.01	2.82	2.60	1.97	1.46	.683		1.33	.931	.693				
e4	7.63	5.00	2.20	5.22	3.70	2.20	1.35	3.43	2.95	2.02	1.35	.932		1.31	.893	.648				
ΣE	45.7	29.0	12.7	28.5	20.6	11.4	6.60	18.2	15.7	10.3	6.74	4.43		7.58	5.09	3.61				
2(ΣE)	91.4	58.0	25.4	57.0	41.2	22.8	13.2	36.4	31.4	20.6	13.5	8.86								
																		3,590	2,740	2,250
F1	22.5	12.0	5.29	13.4	9.62	4.95	2.97	7.67	6.40	4.67	3.00	1.81		2.34	1.54	1.05				
f2	10.0	7.62	2.22	5.97	4.91	1.72	1.35	4.04	3.38	1.37	1.03	1.10		2.43	1.72	1.18				
f3	6.85	4.60	2.62	3.87	3.17	2.24	.971	2.81	2.47	1.96	1.24	.579		1.27	.881	.640				
f4	7.37	5.23	2.04	5.12	3.66	2.21	1.30	3.64	3.06	2.01	1.31	.831		1.29	.890	.643				
ΣF	46.7	29.5	12.2	28.4	21.4	11.1	6.59	18.2	15.3	10.0	6.58	4.10		7.33	5.05	3.41				
2(ΣF)	93.4	59.0	24.4	56.3	42.8	22.2	13.2	36.4	30.6	20.0	13.2	3.10						3,620	2,760	2,230

TABLE A.2 (Continued)

Contaminant: Cobalt 60
Wall Thickness: 93.7 psf
Area of Contaminated Unit: 79.0 ft²

SOURCE POSITIONS (mr/hr)/curie

Dose Rate Contribution Per Row (mr/hr)/(curie/ft²)

Detector Position	31	32	33	35	36	37	38	40	41	42	43	44		34	39	45		Row G	Row H	Row I
a1	3.57	3.20	1.92	2.22	2.17	1.61	1.13	1.37	1.59	1.24	1.03	.652		1.17	.662	.417				
a2	1.41	.400	.329	.817	.270	.224	.279	.554	.240	.189	.177	.209		.441	.298	.221				
a3	1.42	.946	.559	.846	.733	.559	.423	.536	.737	.476	.364	.236		.428	.226	.154				
a4	3.02	1.78	.899	1.94	1.60	1.02	.633	1.31	1.23	.845	.599	.387		.454	.311	.222				
ΣA	9.42	6.33	3.71	5.82	4.77	3.41	2.47	3.77	3.80	2.75	2.17	1.48		2.49	1.50	1.01				
2(ΣA)	18.8	12.7	7.42	11.6	9.54	6.82	4.94	7.54	7.60	5.50	4.34	2.96						3.270	2.720	2.290
b1	3.13	2.43	1.35	1.79	1.80	1.19	.831	1.18	1.24	1.05	.651	.509		.868	.500	.334				
b2	1.75	1.37	.521	1.51	.980	.389	.384	.754	1.02	.810	.680	.260		.548	.339	.236				
b3	1.76	1.30	.704	1.12	.953	.727	.458	.767	1.08	.621	.437	.300		.465	.300	.203				
b4	2.76	1.77	.889	1.74	1.49	1.04	.691	1.14	1.14	.842	.625	.395		.534	.338	.222				
ΣB	9.40	6.87	3.46	6.16	5.22	3.35	2.36	3.84	4.48	3.32	2.39	1.46		2.36	1.48	.995				
2(ΣB)	18.8	13.7	6.92	12.3	10.4	6.70	4.72	7.68	8.96	6.64	4.78	2.92						3.300	2.810	2.530
C6'	2.40	1.64	.936	1.52	1.26	.921	.646	.884	1.32	.747	.558	.406		.612	.369	.250				
8(C6')	19.2	13.1	7.49	12.2	10.1	7.37	5.17	7.07	10.6	5.98	4.46	3.25	4 x C6'	2.45	1.48	1.00		3.330	2.870	2.560
C3'	2.34	1.64	.920	1.30	1.13	.995	.638	.885	1.26	.768	.572	.376		.607	.366	.246				
8(C3')	18.7	13.1	7.36	10.4	9.04	7.96	5.10	7.08	10.1	6.14	4.58	3.01	4 x C3'	2.43	1.46	.984		3.290	2.690	2.530
C9'	1.61	.812	.414	.629	.439	.385	.315	.426	.478	.412	.279	.220		.325	.196	.135				
8(C9')	12.9	6.50	3.31	5.03	3.51	3.08	2.52	3.41	3.82	3.30	2.23	1.76	4 x C9'	1.30	.784	.540		1.900	1.180	1.190
d1	2.84	2.19	1.08	1.77	2.16	1.14	.754	1.16	.884	.914	.665	.459		.640	.386	.267				
d2	2.27	1.64	.724	1.33	1.30	.901	.516	.866	1.27	.949	.635	.343		.647	.388	.268				
d3	1.82	1.46	.844	1.15	1.03	.749	.445	.787	1.06	.660	.421	.269		.544	.340	.233				
d4	2.21	1.47	.821	1.27	1.12	.870	.564	.868	.904	.737	.480	.349		.511	.321	.216				
ΣD	9.14	6.76	3.46	5.52	5.61	3.66	2.28	3.68	4.12	3.26	2.20	1.42		2.34	1.44	.984				
2(ΣD)	18.3	13.5	6.92	11.0	11.2	7.32	4.56	7.36	8.24	6.52	4.40	2.84						3.250	2.800	2.390
e1	3.43	2.85	1.45	2.28	2.01	1.42	.875	1.46	1.48	1.16	.817	.525		.704	.429	.320				
e2	2.36	.786	.615	1.39	.547	.433	.479	.882	.694	.332	.313	.318		.712	.434	.316				
e3	1.58	1.16	.433	1.05	.915	.641	.381	.713	.913	.632	.292	.228		.439	.295	.205				
e4	2.16	1.41	.690	1.29	1.15	.791	.467	.806	1.19	.867	.276	.319		.436	.270	.206				
ΣE	9.53	6.21	3.19	6.01	4.62	3.29	2.20	3.86	4.28	2.99	1.70	1.39		2.29	1.43	1.05				
2(ΣE)	19.1	12.4	6.38	12.0	9.24	6.58	4.40	7.72	8.56	5.98	3.40	2.78						3.180	2.660	2.330
f1	3.69	2.79	1.38	2.23	2.09	1.39	.825	1.46	1.53	1.13	.779	.503		.652	.397	.296				
f2	2.13	.737	.584	1.22	.484	.411	.457	.799	.690	.411	.294	.314		.681	.410	.301				
f3	1.47	1.17	.401	.971	.884	.645	.311	.598	.919	.573	.254	.218		.416	.255	.180				
f4	1.76	1.32	.642	1.20	1.12	.721	.460	.806	.872	.690	.285	.293		.408	.249	.190				
ΣF	9.05	6.02	3.01	5.62	4.58	3.17	2.05	3.66	4.01	2.80	1.61	1.33		2.16	1.31	.967				
2(ΣF)	18.1	12.0	6.02	11.2	9.16	6.34	4.10	7.32	8.02	5.60	3.22	2.66						3.030	2.540	2.200

TABLE A 2 (Continued)

Contaminant: Cobalt 60
Wall Thickness: 93.7 psf
Area of Contaminated Unit: 316 ft²

SOURCE POSITIONS
(mr/hr)/curie

Dose Rate Contribution
Per Row
(mr/hr)/(curie/ft²)

Detector Position	46	47	48	50	51	52	53	55	56	57	58	59		49	54	60		Row J	Row K	Row L
[illegible]	.850	.698	.439	.463	.448	.334	.241	.301	.300	.243	.178	.136		.229	.167	.0382				
[illegible]	.335	.316	.148	.189	.0658	.0714	.0871	.205	.0544	.0482	.0516	.0594		.149	.0935	.0596				
[illegible]	.367	.319	.209	.223	.223	.148	.108	.164	.158	.127	.0939	.0645		.130	.0690	.0492				
[illegible]	.782	.588	.313	.427	.385	.256	.159	.315	.270	.206	.144	.0951		.142	.0864	.0572				
Σ1	2.31	1.78	1.10	1.30	1.12	.809	.595	.985	.782	.624	.468	.355		.650	.416	.204				
Σ(Σ1)	4.62	3.44	2.20	2.60	2.24	1.62	1.19	1.97	1.56	1.25	.936	.710						3,440	2,550	2,100
[illegible]	.668	.500	.376	.386	.400	.267	.184	.262	.262	.209	.151	.109		.186	.124	.0305				
[illegible]	.523	.324	.180	.276	.244	.108	.101	.186	.174	.110	.0669	.0674		.150	.103	.0610				
[illegible]	.486	.377	.237	.308	.271	.182	.123	.201	.192	.143	.102	.0774		.133	.0812	.0508				
[illegible]	.668	.581	.317	.392	.326	.255	.167	.101	.256	.206	.142	.0958		.144	.169	.0570				
[illegible]	2.39	1.81	1.11	1.36	1.29	.812	.575	.750	.884	.668	.462	.350		.613	.477	.199				
[illegible]	4.78	3.62	2.22	2.72	2.58	1.62	1.15	1.50	1.77	1.34	.924	.700						3,540	2,700	2,030
CA°	.549	.477	.258	.327	.313	.223	.153	.218	.230	.171	.128	.0950		.159	.108	.0261				
Σ(CA°)	4.39	3.82	2.06	2.62	2.50	1.78	1.22	1.74	1.84	1.37	1.02	.766	4 x C6[1]	.636	.432	.104		3,440	2,700	2,160
[illegible]	.547	.478	.252	.341	.313	.223	.147	.230	.213	.173	.131	.0938		.156	.107	.0597				
[illegible]	4.38	3.82	2.02	2.73	2.50	1.78	1.18	1.84	1.70	1.38	1.05	.750	4 x C3[1]	.624	.428	.239		3,410	2,720	2,200
[illegible]	.248	.188	.188	.146	.161	.146	.193	.128	.222	.0987	.0758	.0540		.0878	.0571	.0348				
[illegible]	1.98	1.50	1.50	1.17	1.29	1.17	1.54	1.02	1.78	.790	.606	.432	4 x Co[1]	.351	.228	.139		1,690	1,710	1,510
[illegible]	.724	.607	.334	.393	.373	.261	.176	.267	.258	.197	.145	.103		.162	.110	.0647				
[illegible]	.581	.478	.232	.321	.295	.234	.119	.221	.210	.165	.100	.0787		.160	.100	.0656				
[illegible]	.458	.416	.239	.292	.264	.188	.208	.204	.187	.159	.102	.0650		.138	.0926	.0519				
[illegible]	.535	.485	.279	.310	.301	.208	.141	.230	.219	.175	.116	.0840		.144	.0853	.0563				
[illegible]	2.28	1.99	1.08	1.32	1.23	.802	.634	.922	.874	.696	.463	.331		.604	.388	.239				
[illegible]	4.56	3.98	2.16	2.64	2.46	1.78	1.29	1.84	1.75	1.39	.926	.662						3,570	2,700	2,150
[illegible]	.882	.669	.390	.498	.439	.320	.204	.319	.301	.248	.173	.116		.182	.112	.0708				
[illegible]	.533	.188	.213	.299	.131	.111	.116	.208	.0717	.0773	.0750	.0774		.182	.128	.0288				
[illegible]	.436	.309	.199	.252	.247	.166	.0915	.187	.226	.133	.0636	.0608		.130	.0803	.0503				
[illegible]	.561	.442	.256	.321	.314	.204	.134	.225	.209	.167	.116	.0828		.136	.0816	.0566				
[illegible]	2.39	1.69	1.02	1.36	1.13	.802	.546	.939	.808	.625	.428	.337		.630	.408	.207				
[illegible]	4.78	3.38	2.04	2.72	2.26	1.60	1.09	1.87	1.62	1.25	.856	.674						3,400	2,550	2,050
[illegible]	.889	.690	.399	.475	.550	.313	.201	.315	.309	.243	.169	.115		.168	.110	.0695				
[illegible]	.579	.181	.205	.282	.128	.107	.113	.198	.0686	.0746	.0718	.0744		.166	.122	.0304				
[illegible]	.358	.351	.153	.241	.242	.163	.0930	.175	.162	.130	.105	.0361		.125	.0767	.0517				
[illegible]	.516	.416	.230	.295	.295	.198	.135	.215	.200	.162	.117	.0342		.131	.0731	.0519				
[illegible]	2.23	1.64	1.03	1.39	1.22	.781	.542	.901	.740	.610	.463	.330		.590	.382	.200				
[illegible]	4.50	3.22	2.06	2.58	2.44	1.56	1.08	1.80	1.48	1.22	.926	.660						3,290	2,540	1,990

TABLE A.? (Continued)

Contaminant: Cobalt 60
Wall Thickness: 93.7 psf
Area of Contaminated Unit: 1260 ft²

Detector Position	SOURCE POSITIONS (mr/hr)/curie 61	62	63	65	66	67	68	70	71	72	73	74		64	69	75		Dose Rate Contribution Per Row (mr/hr)/(curie/ft²) Row M	Row N	Row C
[illegible]	.176	.144	.0893	.103	.0913	.0647	.0447	.0644	.0594	.0465	.0348	.0255		.0495	.0286	.0162				
[illegible]	.0530	.0300	.0344	.0468	.0183	.0178	.0211	.0302	.0113	.0114	.0128	.0136		.0339	.0201	.0108				
[illegible]	.0965	.0756	.0482	.0561	.0542	.0350	.0236	.0358	.0349	.0142	.0205	.0139		.0254	.0144	.00827				
[illegible]	.172	.127	.0781	.0966	.0867	.0592	.0362	.0575	.0652	.0445	.0310	.0216		.0324	.0208	.0122				
[illegible]	.494	.381	.246	.303	.251	.177	.126	.186	.171	.0766	.0989	.0746		.141	.0839	.0474				
Σ([illegible])	.988	.762	.498	.606	.508	.354	.252	.376	.342	.153	.198	.149						3.000	2.270	1.600
[illegible]	.139	.125	.0751	.0869	.0839	.0554	.0332	.0549	.0532	.0415	.0315	.0219		.0397	.0236	.0135				
[illegible]	.111	.0764	.0404	.0635	.0550	.0289	.0228	.0437	.0396	.0196	.0157	.0149		.0330	.0194	.0108				
[illegible]	.117	.0884	.0555	.0682	.0623	.0418	.0236	.0429	.0423	.0300	.0227	.0159		.0291	.0176	.0113				
[illegible]	.151	.126	.0718	.0881	.0847	.0569	.0357	.0537	.0538	.0426	.0308	.0202		.0321	.0184	.0113				
[illegible]	.518	.416	.243	.307	.286	.183	.125	.195	.188	.134	.101	.0729		.134	.0790	.0469				
Σ([illegible])	1.04	.832	.486	.614	.572	.366	.250	.390	.376	.268	.202	.146						3.140	2.370	1.800
C4°	.126	.100	.0669	.0718	.0703	.0467	.0326	.0465	.0454	.0350	.0258	.0196		.0364	.0211	.0122				
Σ(C4°)	1.02	.800	.535	.574	.562	.374	.261	.372	.363	.280	.206	.157	4 x C6[1]	.146	.0844	.0488		3.140	2.340	1.800
C3°	.135	.103	.0651	.0710	.0728	.0503	.0327	.0486	.0461	.0359	.0275	.0186		.0342	.0210	.0120				
Σ(C3°)	1.08	.824	.521	.568	.582	.402	.262	.389	.369	.287	.220	.149	4 x C3[1]	.137	.0840	.0480		3.230	2.390	1.840
C9°	.0716	.0604	.0418	.0459	.0501	.0305	.0223	.0315	.0291	.0225	.0134	.0112		.0196	.0132	.00764				
Σ(C9°)	.573	.483	.334	.367	.401	.244	.178	.252	.233	.180	.107	.0896	4 x Co[1]	.0784	.0528	.0306		1.850	1.560	1.120
[illegible]	.151	.122	.0739	.0894	.0797	.0547	.0366	.0566	.0548	.0413	.0315	.0210		.0361	.0216	.0125				
[illegible]	.137	.103	.0496	.0727	.0661	.0450	.0266	.0493	.0455	.0334	.0203	.0170		.0370	.0216	.0125				
[illegible]	.113	.0903	.0545	.0666	.0601	.0479	.0234	.0434	.0424	.0313	.0222	.0140		.0304	.0183	.0109				
[illegible]	.137	.105	.0630	.0739	.0762	.0475	.0308	.0434	.0476	.0317	.0243	.0185		.0314	.0180	.0109				
[illegible]	.538	.420	.241	.303	.282	.195	.117	.193	.190	.138	.0983	.0705		.135	.0795	.0468				
Σ([illegible])	1.08	.840	.482	.606	.564	.390	.234	.386	.380	.276	.197	.141						3.190	2.360	1.800
[illegible]	.183	.145	.0836	.110	.0930	.0640	.0412	.0648	.0644	.0477	.0363	.0223		.0378	.0225	.0128				
[illegible]	.113	.0459	.0454	.0647	.0294	.0258	.0264	.0420	.0196	.0170	.0159	.0164		.0392	.0227	.0135				
[illegible]	.107	.0828	.0374	.0599	.0551	.0382	.0211	.0397	.0371	.0138	.0147	.0132		.0238	.0176	.0106				
[illegible]	.132	.102	.0595	.0739	.0713	.0487	.0313	.0493	.0461	.0369	.0265	.0185		.0304	.0185	.0110				
[illegible]	.535	.375	.226	.310	.249	.177	.120	.196	.167	.115	.0934	.0704		.135	.0813	.0479				
[illegible]	1.07	.750	.452	.620	.498	.354	.240	.392	.334	.230	.187	.141						3.040	2.260	1.680
[illegible]	.178	.152	.0837	.102	.0943	.0639	.0402	.0657	.0649	.0498	.0356	.0231		.0387	.0208	.0113				
[illegible]	.103	.0536	.0534	.0591	.0284	.0287	.0247	.0383	.0193	.0172	.0157	.0169		.0398	.0232	.0136				
[illegible]	.106	.0774	.0349	.0563	.0538	.0347	.0202	.0382	.0366	.0136	.0145	.0125		.0262	.0159	.0107				
[illegible]	.121	.0998	.0633	.0719	.0690	.0488	.0324	.0463	.0449	.0360	.0264	.0184		.0273	.0182	.0111				
[illegible]	.508	.372	.225	.289	.246	.176	.118	.189	.166	.117	.0922	.0709		.132	.0782	.0467				
[illegible]	1.02	.744	.450	.578	.492	.352	.236	.378	.332	.234	.184	.142						2.960	2.190	1.660

TABLE A (Continued)

Contaminant: Cobalt 60
Wall Thickness: 93.7 lbs/ft²
Area of Contaminated Unit: 5060 ft²

SOURCE POSITIONS (mr/hr/curie)

Dose Rate Contribution For Row (mr/hr)/(curie/ft²)

Position	[illegible]	77	78	80	81	82	83	85	86	87	88	89		79	84	90		Row P	Row Q	Row R
[illegible]	[illegible]	.0235	.0157	.0201	.0163	.0119	.00520	[illegible]	.0108	.00734	.00394	.00409		.00916	.00544	.00290				
[illegible]	.00857	.00865	.00717	.00709	.00376	.00394	.00889	.00566	.00264	.00229	.00236	.00231		.00692	.00412	.00223				
[illegible]	.0139	.0147	.00934	.0123	.0103	.00722	.00399	.00761	.00687	.00525	.00372	.00247		.00521	.00314	.00172				
[illegible]	.0180	.0231	.0136	.0193	.0183	.0113	.00665	.0123	.0112	.00589	.00539	.00372		.00670	.00424	.00230				
[illegible]	.0949	.0680	.0458	.0588	.0487	.0344	.0187	.0380	.0315	.0214	.0154	.0126		.0280	.0169	.00915				
[illegible]	.130	.136	.0916	.118	.0974	.0688	.0374	.0760	.0630	.0428	.0308	.0252						2,260	1,720	1,250
[illegible]	.0296	.0218	.0132	.0194	.0147	.0110	.00458	.0111	.0102	.00805	.00540	.00369		.00633	.00476	.00257				
[illegible]	.0215	.0133	.00789	.0139	.0106	.00523	.00353	.00869	.00744	.00372	.00288	.00247		.00672	.00407	.00226				
[illegible]	.0865	.0458	.0106	.0151	.0121	.00879	.00423	.00694	.00771	.00589	.00427	.00261		.00605	.00365	.00209				
[illegible]	.0311	.0224	.0133	.0188	.0151	.0111	.00637	.0119	.00998	.00739	.00526	.00337		.00690	.00407	.00238				
[illegible]	.109	.0733	.0450	.0662	.0525	.0361	.0151	.0406	.0353	.0251	.0178	.0121		.0280	.0166	.00930				
[illegible]	.218	.147	.0900	.132	.105	.0722	.0382	.0612	.0706	.0502	.0356	.0242						2,440	1,840	1,370
C3°	.0253	.0155	.0122	.0153	.0123	.00984	.00467	.00946	.00824	.00631	.00469	.00331		.00750	.00442	.00249				
4(C3°)	.194	.148	.0976	.122	.0964	.0739	.0374	.0757	.0659	.0505	.0375	.0265	4 x C6[1]	.0300	.0177	.00996		2,390	1,770	1,350
C3°	.0254	.0139	.0111	.0167	.0130	.00984	.00453	.00983	.00853	.00671	.00482	.00317		.00696	.00414	.00231				
4(C3°)	.203	.139	.0888	.134	.104	.0787	.0362	.0786	.0682	.0537	.0386	.0254	4 x C3[1]	.0278	.0166	.00924		2,420	1,870	1,390
[illegible]	.0180	.0132	.00799	.0130	.00945	.00776	.00342	.00790	.00692	.00518	.00338	.00227		.00469	.00310	.00173				
[illegible]	.144	.106	.0639	.104	.0756	.0621	.0274	.0632	.0554	.0414	.0270	.0192	4 x C0[1]	.0188	.0124	.00692		1,680	1,430	1,040
[illegible]	[illegible]	.0219	.0135	.0189	.0149	.0109	.00627	.0115	.0101	.00732	.00538	.00369		.00718	.00471	.00250				
[illegible]	.0272	.0181	.00911	.0156	.0124	.00916	.00377	.00946	.00824	.00609	.00358	.00273		.00717	.00439	.00242				
[illegible]	.0224	.0178	.00969	.0155	.0126	.00823	.00374	.00890	.00787	.00605	.00416	.00253		.00653	.00387	.00216				
[illegible]	.0267	.0178	.0115	.0166	.0135	.00994	.00560	.0104	.00781	.00681	.00457	.00310		.00641	.00404	.00232				
[illegible]	.0965	.0756	.0438	.0666	.0528	.0382	.0194	.0403	.0346	.0263	.0177	.0121		.0273	.0170	.00940				
[illegible]	.159	.151	.0876	.133	.106	.0764	.0388	.0806	.0680	.0526	.0354	.0242						2,300	1,880	1,370
[illegible]	.0369	.0868	.0157	.0221	.0173	.0127	.00742	.0129	.0114	.00866	.00599	.00382		.00750	.00450	.00254				
[illegible]	.0216	.00986	.00857	.0142	.00576	.00523	.00365	.00851	.00398	.00322	.00295	.00269		.00756	.00460	.00252				
[illegible]	.0204	.0150	.00757	.0136	.0107	.00745	.00345	.00871	.00691	.00532	.00280	.00229		.00641	.00364	.00203				
[illegible]	.0278	.0199	.0124	.0172	.0134	.00974	.00613	.0106	.00901	.00714	.00505	.00341		.00657	.00465	.00242				
[illegible]	.167	.0710	.0442	.0571	.0472	.0352	.0207	.0407	.0313	.0243	.0168	.0122		.0280	.0166	.00951				
[illegible]	.224	.142	.0884	.134	.0944	.0704	.0414	.0814	.0626	.0486	.0336	.0244						2,390	1,810	1,320
[illegible]	.0356	.0257	.0146	.0219	.0173	.0125	.00731	.0132	.0115	.00861	.00605	.00382		.00750	.00446	.00252				
[illegible]	.0199	.00868	.00809	.0133	.00555	.00515	.00353	.00792	.00371	.00306	.00283	.00263		.00771	.00451	[illegible]				
[illegible]	.0210	.0153	.00704	.0128	.0105	.00692	.00341	.00846	.00703	.00522	.00268	.00222		.00611	.00341	.00190				
[illegible]	.0357	.0211	.0126	.0164	.0133	.00987	.00622	.0101	.00909	.00703	.00509	.00395		.00659	.00384	.00234				
[illegible]	.112	.0708	.0423	.0644	.0467	.0344	.0205	.0397	.0313	.0239	.0167	.0126		.0279	.0162	.00917				
[illegible]	.224	.142	.0846	.129	.0934	.0688	.0410	.0794	.0626	.0478	.0334	[illegible]						[illegible]	[illegible]	1,310

TABLE A-[illegible] POINT SOURCE DATA AND CONVERSION TO AREA SOURCE RADIATION

Contaminant: Cobalt 60
Wall Thickness: 139 psf
Area of Simulated Unit: 2.44 ft² (Positions 3 - 4); 4.46 ft² (Positions 5 - 15)

SOURCE POSITIONS (mr/hr)/curie

Dose Rate Contribution Per Row (mr/hr)/(curie/ft²)

[illegible]	3	[illegible]	[illegible]	4	#5	#6	#7	#8	#10	#11	#12	#13	#14		c	#9	#15		Row A	Row B	Row C
[illegible]	4.18	12.0	29.6	21.0	7.49	17.8	27.5	18.2	10.2	13.1	18.2	13.8	6.85		[illegible]	[illegible]	4.18				
[illegible]	3.1?	3.89	5.68	4.70	3.34	3.59	3.94	.935	3.10	3.74	2.44	.868	.327		.222	.212	.215				
[illegible]	1.14	2.69	2.05	1.88	2.92	1.92	1.64	.856	2.51	2.03	1.32	.899	.515		.510	.469	.401				
[illegible]	1.01	.607	.389	.855	2.75	.801	.503	.207	4.09	2.08	.805	.384	.234		.232	.218	.214				
[illegible]	11.5	20.6	37.7	27.3	16.5	24.1	33.6	20.2	19.9	21.0	22.8	16.0	7.93		8.32	7.70	5.01				
[illegible]	23.0	41.2	75.4	54.6	33.0	48.2	67.2	40.4	39.8	42.0	45.6	32.0	15.9						495	879	803
[illegible]	32.0	21.8	12.2	8.64	12.3	4.28	12.0	5.75	10.7	10.1	8.21	5.17	2.66		3.05	2.52	1.89				
[illegible]	9.59	7.78	7.95	5.17	5.13	4.91	4.91	2.92	4.49	4.18	3.47	2.58	.713		.485	.611	.503				
[illegible]	-.06	4.55	3.32	1.98	4.77	3.26	2.50	1.34	4.42	2.53	2.17	1.37	.758		.735	.732	.571				
[illegible]	11.0	4.39	2.25	.990	9.30	4.03	2.68	.921	7.77	4.98	2.54	1.37	.627		.522	.528	.497				
[illegible]	48.2	38.5	25.7	16.8	31.5	16.5	22.1	10.9	2.74	22.2	16.4	10.5	4.76		4.79	4.39	3.46				
[illegible]	96.4	77.0	51.4	33.6	63.0	33.0	44.2	21.8	54.8	44.4	32.8	21.0	9.52						642	740	740
[illegible]	6.85	5.33	3.64	2.25	5.13	3.96	3.44	1.78	4.90	3.97	3.06	1.96	2.45		.781	.946	.805				
[illegible]	54.8	42.6	29.1	18.0	41.0	31.7	27.5	14.2	39.2	31.8	24.5	15.7	19.6	4 x C6¹	3.12	3.78	3.22		371	526	598
[illegible]	23.7	9.13	6.80	3.76	8.28	6.22	4.73	2.43	6.68	5.52	4.02	2.42	1.27		1.28	1.24	8.96				
[illegible]	110.0	73.0	54.4	30.1	66.2	49.8	37.8	19.4	53.4	44.2	32.2	19.4	10.2	4x C3¹	5.10	4.96	3.58		666	794	727
[illegible]	15.1	9.95	7.24	5.08	7.83	5.75	4.67	2.29	5.56	4.83	3.28	2.13	1.15		1.29	1.09	.764				
[illegible]	121.0	79.6	57.9	32.6	62.6	46.0	37.4	18.3	44.5	38.6	26.2	17.0	9.20	4 x Co¹	5.20	4.36	3.05		722	914	620
[illegible]	26.9	11.8	6.58	2.79	14.2	8.96	5.61	2.47	11.0	8.29	5.32	2.95	1.40		1.17	1.17	.956				
[illegible]	16.5	12.0	11.5	7.22	7.71	8.02	7.81	4.33	6.43	6.54	5.13	2.63	1.54		1.17	1.18	.964				
[illegible]	8.84	6.70	5.73	3.54	6.43	4.52	3.93	2.20	4.57	3.86	2.84	1.87	1.10		.723	.688	.604				
[illegible]	8.11	5.05	3.30	1.72	6.72	3.88	2.83	1.30	5.61	3.86	2.69	1.45	.777		.737	.697	.581				
[illegible]	50.4	35.6	27.1	15.3	35.1	25.4	20.2	10.3	27.6	22.6	15.98	8.90	4.82		3.80	3.74	3.11				
[illegible]	101.0	71.2	54.2	30.6	70.2	50.8	40.4	20.6	55.2	45.2	32.0	17.6	9.64						637	830	727
[illegible]	12.9	4.73	1.93	.855	14.7	6.95	3.71	1.17	13.9	9.47	4.94	2.38	.982		.529	.653	.711				
[illegible]	7.28	9.04	10.4	7.51	5.23	6.68	7.50	2.21	5.07	5.73	4.90	2.12	.866		.509	.684	[illegible]				
[illegible]	5.28	4.58	6.49	2.78	3.77	3.28	3.12	1.70	3.45	2.97	2.35	1.59	.586		.376	.425	.381				
[illegible]	6.74	2.08	1.48	.768	3.80	1.92	1.31	.619	3.69	2.48	1.64	.808	.461		.389	.400	.375				
[illegible]	30.9	20.4	20.3	11.9	27.5	18.8	15.6	5.70	26.1	20.7	13.8	6.90	2.90		1.80	2.16	2.11				
[illegible]	61.8	40.8	40.6	23.8	55.0	37.6	31.2	11.4	52.2	41.4	27.6	13.8	5.80						412	611	638
[illegible]	26.1	8.13	2.84	.956	23.5	9.97	3.91	1.38	17.8	11.6	5.41	2.33	1.12		.603	.698	.684				
[illegible]	9.21	10.8	12.1	9.31	5.74	7.82	8.46	2.52	5.43	5.90	5.14	2.39	.871		.576	.745	.686				
[illegible]	6.10	4.95	4.39	3.05	3.85	3.45	3.11	1.84	3.37	2.85	2.47	1.58	.608		.389	.434	.387				
[illegible]	6.80	2.50	1.71	.820	4.03	2.08	1.38	.678	3.89	2.58	1.53	.807	.450		.428	.398	.370				
[illegible]	48.2	26.4	21.0	14.1	37.1	23.3	16.9	6.42	30.5	22.9	14.6	7.11	3.05		2.00	2.28	2.13				
[illegible]	96.4	52.8	42.0	28.2	74.2	46.6	33.8	12.8	61.0	45.8	29.2	14.2	6.10						539	758	705

TABLE A.1 (Continued)

Contaminant: Cobalt 60
Wall Thickness: 139 psf
Area of Simulated Units: 17.8 ft²

SOURCE POSITIONS (mr/hr)/curie

Dose Rate Contribution Per Row (mr/hr)/(curie/ft²)

Detector Position	#[illegible]	#17	#18	#20	#21	#22	#23	#25	#26	#27	#28	#29		#19	#24	#30		Row D	Row E	Row F
[illegible]	[illegible]	9.63	4.66	4.60	5.29	3.54	2.04	3.13	3.06	2.58	1.68	1.08		2.14	1.03	.710				
[illegible]	2.12	1.46	.301	1.52	1.14	.357	.190	1.39	.782	.313	.161	.132		.188	.189	.150				
[illegible]	1.86	1.06	.482	1.26	1.15	.563	.310	.860	.632	.539	.334	.215		.590	.241	.193				
[illegible]	1.48	.07	.342	2.93	1.71	.670	.332	2.08	1.58	.880	.429	.240		.176	.206	.160				
[illegible]	5.2	11.2	5.79	10.3	9.29	5.13	2.87	7.46	6.25	4.31	2.60	1.67		2.79	1.67	1.21				
[illegible]	10.4	[illegible]	11.6	20.6	18.6	10.3	5.74	14.9	12.5	8.62	5.20	3.34						1,270	1,010	815
[illegible]	6.08	4.96	2.30	3.75	3.54	2.02	1.01	2.33	2.21	1.63	1.06	.629		1.03	.618	.439				
[illegible]	3.08	2.32	.621	1.86	1.82	.898	.357	1.21	1.14	.858	.318	.240		.358	.294	.221				
[illegible]	2.77	1.53	.770	1.90	1.39	.704	.440	1.17	1.09	.756	.316	.285		.572	.307	.209				
[illegible]	4.53	2.02	.752	3.43	2.23	1.03	.524	2.02	1.74	1.06	.561	.239		.370	.320	.230				
[illegible]	6.5	10.8	4.44	10.8	8.98	4.65	2.33	6.73	6.18	4.30	2.26			2.33	1.54	1.10				
[illegible](C3)	13.0	21.6	8.88	21.8	18.0	9.30	4.66	13.5	12.4	8.60	4.52							1,170	984	714
C4°	3.32	2.30	1.06	2.49	1.86	1.11	.631	1.51	1.28	.930	.396	.416		.550	.397	.296				
[illegible](C4°)	7.0	18.4	8.48	19.9	14.9	8.88	5.05	12.1	9.44	7.44	3.17	3.33	4 x C6¹	2.20	1.59	1.18		999	895	653
C3°	4.38	2.52	1.14	2.68	2.03	1.11	.630	1.61	1.44	.985	.414	.395		.563	.391	.293				
[illegible](C3°)	[illegible]	20.2	9.12	21.4	16.2	8.88	5.04	12.9	11.5	7.88	3.31	3.16	4 x C3¹	2.25	1.56	1.17		1,160	945	10
																		1,000	762	518
C2°	3.80	2.12	.892	2.28	1.66	.875	.421	.985	1.87	.706	.438	.236		.414	.232	.185				
[illegible](C2°)	[illegible]	17.0	7.14	18.2	13.3	7.00	3.37	7.88	15.0	5.65	3.50	1.89	4 x Co¹	1.66	.928	.740				
[illegible]	5.87	3.42	1.34	3.69	2.75	1.54	.801	2.25	1.90	1.22	.831	.494		.607	.431	.310				
[illegible]	4.25	3.19	1.43	2.69	2.39	1.37	.601	1.57	1.89	1.23	.460	.363		.643	.451	.315				
[illegible]	[illegible]	[illegible]	.921	2.03	1.53	.942	.531	1.23	1.18	.842	.468	.268		.601	.301	.228				
[illegible]	3.2[illegible]	1.85	.787	2.49	2.02	.895	.495	1.45	1.38	.853	.507	.322		.569	.310	.226		1,160	981	757
[illegible]	6.5	10.3	4.46	10.9	8.69	4.75	2.43	6.51	6.35	4.15	2.27	1.45		2.42	1.50	1.08				
[illegible]	13.0	21.0	8.92	21.8	17.4	9.50	4.86	13.0	12.7	8.30	4.54	2.90								
[illegible]	7.80	3.96	1.27	4.52	3.54	1.64	.759	2.98	2.51	1.72	.936	.493		.503	.416	.299				
[illegible]	3.55	2.88	.689	2.41	2.09	.675	.405	1.52	1.39	.616	.356	.298		.526	.416	.335				
[illegible]	2.27	1.57	.397	1.69	1.35	.776	.299	.958	1.00	.709	.468	.199		.300	.249	.168				
[illegible]	2.61	1.25	.482	1.96	1.47	.723	.394	1.33	1.13	.727	.438	.246		.314	.266	.179		1,060	904	730
[illegible]	6.3	9.61	3.15	10.6	8.45	3.81	1.86	6.77	6.03	3.77	2.20	1.24		1.64	1.35	.961				
[illegible]	12.6	19.2	6.32	21.2	16.9	7.62	3.72	13.5	12.1	7.54	4.40	2.48								
[illegible]	9.27	4.14	1.36	5.21	3.72	1.71	.768	3.21	2.63	1.74	.938	[illegible]		.514	.404	.300				
[illegible]	2.72	2.20	.709	2.46	2.20	.675	.405	1.46	1.38	.601	.410	[illegible]		.544	.403	.300				
[illegible]	2.27	1.57	.689	1.62	1.35	.763	.284	.930	.932	.686	.419	[illegible]		.275	.235	.159				
[illegible]	2.66	1.25	.497	1.87	1.40	.681	.375	1.23	1.12	.719	.407	[illegible]		.259	.241	[illegible]		1,140	931	733
[illegible]	7.9	10.2	3.27	11.2	8.67	3.81	1.83	6.93	6.06	3.75	2.17	1.21		1.59	1.28	.932				
[illegible]	15.8	20.4	6.54	22.4	17.3	7.62	3.66	13.9	12.1	7.50	4.34	2.42								

TABLE A 3 (Continued)

Contaminant: Cobalt 60
Wall Thickness: 139 psf
Area of Simulated Unit: 71.3 ft²

SOURCE POSITIONS
(mr/hr)/curie

Dose Rate Contribution
Per Row
(mr/hr)/(curie/ft²)

Detector Position	#31	#32	#33	#35	#36	#37	#38	#40	#41	#42	#43	#44		#34	#39	#45		Row G	Row H	Row I
a₁	1.77	1.25	.641	1.16	.764	.489	.313	.589	.531	.376	.251	.185		.373	.210	.188				
a₂	.522	.156	.120	.317	.111	.0681	.0655	.210	.0903	.0559	.0464	.0490		.112	.0792	.0560				
a₃	.544	.302	.165	.343	.237	.156	.0980	.234	.192	.125	.0879	.0602		.0945	.0647	.0434				
a₄	1.24	.583	.231	.745	.466	.252	.144	.514	.388	.237	.149	.0897		.116	.0756	.0571				
Σa	4.08	2.29	6.93	2.57	1.58	.465	.621	1.55	1.20	.794	.534	.284		.696	.430	.345				
2(Σa)	8.16	4.58	13.9	5.14	3.16	1.93	1.24	3.10	2.40	1.59	1.07	.568						1,950	848	647
b₁	1.33	.854	.444	.767	.577	.359	.237	.487	.428	.164	.196	.134		.265	.156	.101				
b₂	.709	.473	.158	.552	.320	.177	.0978	.292	.242	.154	.0754	.0639		.151	.0924	.0654				
b₃	.731	.447	.213	.452	.294	.198	.119	.299	.337	.163	.111	.0756		.127	.0824	.0551				
b₄	1.22	.644	.280	.681	.469	.271	.159	.462	.381	.245	.156	.0948		.147	.0917	.0649				
Σb	3.99	2.42	5.09	2.45	1.66	.950	.613	1.54	1.29	.726	.538	.368		.690	.423	.280				
2(Σb)	7.98	4.84	10.2	4.90	3.32	1.90	1.23	3.08	2.58	1.45	1.08	.736						1,690	841	657
C6'	.970	.558	.232	.588	.406	.252	.177	.378	.307	.195	.146	.0997		.180	.114	.0791				
8(C6')	7.76	4.46	2.34	4.70	3.25	2.02	1.42	3.02	2.46	1.56	1.17	.798	4 x C6'	.720	.456	.316		1,090	841	665
C3'	1.01	.695	.292	.531	.433	.259	.169	.379	.320	.205	.146	.0968		.175	.108	.0762		1,190	927	676
8(C3')	8.08	5.56	2.34	4.65	3.46	2.07	1.35	3.03	2.56	1.64	1.17	.774	4 x C3'	.700	.432	.305				
CO'	.658	.390	.156	.395	.240	.127	.0891	.178	.148	.104	.0850	.0560		.117	.0443	.0422		720	612	337
8(CO')	5.26	3.12	1.25	3.16	1.92	1.02	.713	1.42	1.18	.832	.680	.448	4 x CO'	.468	.177	.169				
d₁	1.33	.551	.364	.741	.516	.329	.206	.483	.388	.270	.181	.120		.198	.0917	.0822				
d₂	.960	.617	.254	.567	.423	.252	.137	.359	.323	.205	.141	.0882		.200	.125	.0803				
d₃	.729	.507	.243	.440	.328	.199	.114	.356	.251	.210	.140	.0685		.148	.0895	.0631				
d₄	.980	.521	.249	.550	.376	.218	.140	.355	.299	.178	.135	.0892		.149	.0748	.0631				
Σd	3.94	2.20	1.11	2.30	1.64	.998	.597	1.55	1.26	.863	.597	.366		.695	.381	.289		1,080	791	682
2(Σd)	7.88	4.40	2.22	4.60	3.28	2.00	1.19	3.10	2.52	1.73	1.19	.732								
e₁'	1.64	1.08	.425	.983	.633	.403	.226	.589	.488	.318	.216	.131		.195	.129	.0839				
e₂'	.989	.318	.177	.512	.214	.131	.118	.345	.203	.102	.0803	.0778		.200	.125	.0837				
e₃'	.591	.378	.135	.398	.220	.180	.0885	.275	.218	.154	.0706	.0544		.122	.0771	.0557				
e₄'	.837	.456	.209	.505	.339	.181	.126	.341	.279	.166	.113	.0755		.113	.0772	.0546				
Σe'	4.01	2.18	.946	2.34	1.47	.845	.559	1.55	1.19	.740	.480	.339		.630	.408	.283		1,060	777	633
2(Σe')	8.02	4.36	1.89	4.68	2.94	1.79	1.12	3.10	2.38	1.48	.960	.678								
f₁'	.174	.748	.412	.981	.659	.390	.226	.625	.517	.327	.214	.135		.190	.118	.0822				
f₂'	.832	.306	.170	.498	.206	.126	.113	.317	.214	.0990	.0817	.0741		.182	.149	.0805				
f₃'	.587	.370	.139	.371	.279	.168	.0817	.244	.203	.140	.0713	.0545		1.15	.0747	.0506				
f₄'	.981	.423	.196	.486	.324	.190	.114	.317	.253	.162	.112	.0705		.115	.740	.0515				
Σf'	2.57	1.85	.916	2.34	1.47	.874	.535	1.50	1.19	.728	.479	.334		1.64	.416	.265		877	777	622
2(Σf')	5.14	3.70	1.83	4.68	2.94	1.75	1.07	3.00	2.38	1.46	.958	.668								

TABLE A 3 (Continued)

Contaminant: Cobalt 60
Wall Thickness: 139 psf
Area of Simulated Unit: 285 ft²

Reactor position	Source Positions (mr/hr)/curie, Determined Graphically: #46	#47	#48	#50	#51	#52	#53	#55	#56	#57	#58	#59			Determined Graphically: #49	#54	#60	Dose Rate Contribution Per Row (mr/hr)/(curie/ft²): Row J	Row K	Row L
A1	.334	.229	.127												.0799					
A2	.118	.0482	.0314												.0392					
A3	.138	.0856	.0508												.0289					
A4	.283	.156	.0810												.0363					
ΣA	.873	.519	.290												.184			1,010		
2(ΣA)	1.75	1.04	.590																	
B1	.262	.178	.0972												.0635					
b2	.165	.101	.0447												.0415					
b3	.165	.101	.0579												.0361					
b4	.253	.151	.0790												.0438					
ΣB	.845	.585	.279												.135					
2(ΣB)	1.69	1.05	.558															992		
C6'	.204	.125	.0726	.109	.115	.0750	.0483	.0718	.0565	.0492	.0260	.0320			.0518	.0250	.0168			
8(C6')	1.63	1.00	.581	.872	.920	.600	.386	.574	.452	.394	.208	.256		4 x C6'	.207	.100	.0672	975	821	556
C3'	.202	.128	.0756	.124	.129	.0695	.0423	.0819	.0741	.0510	.0275	.0250			.0455	.0253	.0175			
8(C3')	1.62	1.02	.605	.992	1.03	.556	.338	.655	.593	.408	.220	.200		4 x C3'	.182	.101	.0700	976	861	613
C''	.112	.0665	.0473	.0895	.0455	.0275	.0170	.0550	.0440	.0316	.0205	.0150			.0283	.0170	.0116			
2(C'')	.806	.534	.378	.716	.364	.220	.136	.472	.354	.253	.164	.120		4 x Co'	.113	.0680	.0464	544	428	402
D1	.276	.178	.0914												.0438					
d2	.207	.132	.0570												.0522					
d3	.165	.116	.0628												.0414					
d4	.195	.130	.0602												.0392					
ΣD	.841	.547	.281												.177					
2(ΣD)	1.68	1.09	.562															1,000		
E1'	.319	.205	.107												.0525					
e1'	.183	.0632	.0461												.0514					
e1'	.0887	.0987	.0956												.0363					
e1'	.188	.111	.0595												.0341					
ΣE1'	.772	.478	.251												.174					
2(ΣE1')	1.54	.956	.502															903		
E2'	.314	.208	.104												.0505					
e2'	.176	.0998	.0473												.0525					
e2'	.169	.0873	.0980												.0384					
e2'	.178	.106	.622												.0342					
ΣE2'	.827	.461	.811												.176					
2(ΣE2')	1.66	.922	1.62															1,250		

TABLE A 3 (Continued)

Contaminant: Cobalt 60
Wall Thickness: 139 psf
Area of Simulated Unit: 1140 ft²

Detector Position	Determined Graphically #61	#62	#63	#65	#66	#67	#68	#70	#71	SOURCE POSITIONS (mr/hr)/curie #72	#73	#74			Determined Graphically #64	#69	#75		Dose Rate Contribution Per Row (mr/hr)/(curie/ft²) Row M	Row N	Row O
[illegible]	.0739	.0441	.0868												.0162						
[illegible]	.0177	.00881	.00618												.00100						
[illegible]	.0333	.0391	.0127												.00705						
[illegible]	.0638	.0384	.0198												.00919						
[illegible]	.186	.130	.141												.0334						
Σ([illegible])	.372	.260	.282																1,060		
[illegible]	.0524	.0384	.0216												.0134						
[illegible]	.0340	.0267	.0104												.0100						
[illegible]	.0407	.0255	.0140												.00839						
[illegible]	.0563	.0339	.0134												.0101						
[illegible]	.187	.127	.0654												.0419						
Σ([illegible])	.374	.254	.131																913		
C6'	.0418	.0303	.0171	.0288	.0305	.0210	.0137	.0158	.0129	.0115	.00630	.00880			.0101	.00630	.00425				
Σ(C6')	.334	.242	.137	.230	.244	.168	.110	.126	.103	.0920	.0504	.0704		4 x C6'	.0404	.0252	.0170		858	886	523
C3'	.0498	.0320	.0171	.0310	.0343	.0183	.0113	.0177	.0172	.0120	.00640	.00630			.0111	.00650	.00445				
Σ(C3')	.398	.256	.137	.248	.274	.146	.0904	.142	.138	.0960	.0512	.0504		4 x C3'	.0444	.0260	.0178		952	894	564
C0'	.0296	.0175	.0107	.0145	.00850	.00520	.00340	.0129	.00980	.00699	.00448	.00345			.00660	.00440	.00298				
Σ(C0')	.237	.140	.0856	.116	.0680	.0416	.0272	.103	.0784	.0559	.0358	.0276		4 x C0'	.0264	.0176	.0119		557	308	[illegible]
[illegible]	.0592	.0371	.0214												.0142						
[illegible]	.0428	.0305	.0135												.0115						
[illegible]	.0460	.0270	.0140												.00999						
[illegible]	.0466	.0300	.0158												.0118						
[illegible]	.185	.125	.0647												.0475				909		
Σ([illegible])	.370	.250	.129																		
[illegible]	.0690	.0451	.0239												.0152						
[illegible]	.0433	.0147	.0112												.00936						
[illegible]	.0340	.0224	.00953												.00922						
[illegible]	.0455	.0233	.0152												.0113						
[illegible]	.192	.111	.0598												.0451				879		
Σ([illegible])	.384	.222	.120																		
[illegible]	.0714	.0444	.0239												.0176						
[illegible]	.0368	.0141	.0107												.00872						
[illegible]	.0353	.0219	.00982												.00910						
[illegible]	.0436	.0275	.0162												.0112						
[illegible]	.187	.108	.0606												.0456				864		
Σ([illegible])	.374	.215	.121																		

TABLE A 3 (Continued)

Contaminant: Cobalt 60
Wall Thickness: 139 psf
Area of Simulated Unit: 4650 ft²

Detector Position	Determined Graphically							SOURCE POSITIONS (mr/hr)/curie						Determined Graphically				Dose Rate Contribution Per Row (mr/hr)/(curie/ft²)		
	#76	#77	#78	#80	#81	#82	#83	#85	#86	#87	#88	#89		#79	#84	#90		Row P	Row Q	Row R
a1	.0156	.0101	.00882					.00482	.00438	.00309	.00204	.00142		.00350		.00194				
a2	.00404	.00856	.00822					.00219	.00106	.00115	.00156	.000845		.00192		.00108				
a3	.00885	.00612	.00637					.00305	.00248	.00186	.00151	.000855		.00184		.000780				
a4	.0156	.0101	.0969					.00513	.00414	.00312	.00167	.00119		.00250		.000854				
ΣA	.0441	.0289	.0151					.0152	.0121	.00922	.00678	.00431		.00976		.00395				
2(ΣA)	.0882	.0578	.0302					.0304	.0242	.0184	.0136	.00862						848		434
b1	.0134	.00966	.0508					.00449	.00379	.00285	.00192	.00124		.00311		.00101				
b2	.00974	.00507	.00872					.00348	.00265	.00135	.00975	.000863		.00259		.00102				
b3	.00994	.00652	.00969					.00359	.00282	.00187	.00139	.000923		.00225		.000910				
b4	.0136	.00958	.00988					.00482	.00455	.00292	.00193	.00119		.00254		.000882				
ΣB	.0467	.0308	.0639					.0164	.0138	.00899	.00622	.00422		.0105		.00382				
2(ΣB)	.0934	.0616	.126					.0328	.00276	.0180	.0124	.00844						1,330		359
C6'	.00990	.00706	.00452	.00710	.00805	.00378	.00380	.00340	.00288	.00217	.00143	.00104		.00245	.00160	.000936				
8(C6')	.0792	.0565	.0362	.0568	.0644	.0302	.0304	.0272	.0230	.0174	.0114	.00832	4 x C6'	.00980	.00640	.00374		830	897	415
C3'	.0117	.00766	.00469	.00720	.00910	.00394	.00292	.00385	.00335	.00240	.00156	.00108		.00255	.00165	.000981				
8(C3')	.0936	.0613	.0375	.0576	.0728	.0315	.0234	.0308	.0268	.0192	.0125	.00864	4 x C3'	.0102	.00660	.00392		926	876	465
C0'	.00881	.00573	.00837	.00240	.00156	.00209	.000670	.00297	.00157	.00157	.000968	.000861		.00201	.00114	.000693				
8(C0')	.0705	.0458	.0270	.0190	.0125	.0167	.00536	.0238	.0126	.0126	.000798	.00689	4 x C0'	.00804	.00456	.00277		689	266	304
D1	.0142	.00902	.00575					.00532	.00394	.00286	.00182	.00115		.00282		.000970				
d2	.0115	.00742	.00850					.00383	.00325	.00225	.00123	.000941		.00284		.000981				
d3	.00889	.00657	.00838					.00338	.00317	.00209	.00130	.000930		.00234		.000946				
d4	.0118	.00771	.00414					.00411	.00340	.00245	.00153	.00104		.00241		.000873				
ΣD	.0475	.0307	.0168					.0166	.0138	.00965	.00688	.00403		.0104		.00377				
2(ΣD)	.0950	.0614	.0336					.0332	.0276	.0193	.0117	.00806						912		474
E1'	.0152	.0114	.00658					.00524	.00330	.00318	.00216	.00136		.00285		.000931				
e1'	.00996	.00541	.00886					.00824	.00156	.00121	.000953	.000934		.00289		.000992				
e1'	.00922	.00513	.00867					.00824	.00248	.00180	.000939	.000756		.00230		.00100				
e1'	.0113	.00756	.00418					.00397	.00336	.00244	.00201	.000994		.00223		.000827				
ΣE1'	.0451	.0281	.0162					.0157	.0107	.00863	.00606	.00404		.0103		.00375				
2(ΣE1')	.0902	.0562	.0324					.0314	.0214	.0173	.0121	.00808						862		412
E2'	.0176	.0112	.00696					.00555	.00470	.00325	.00212	.00131		.00276		.000924				
e2'	.00922	.00687	.00875					.00806	.00159	.00117	.000945	.000871		.00282		.000969				
e2'	.00910	.00605	.00899					.00317	.00251	.00187	.000883	.000808		.00222		.000979				
e2'	.0112	.00766	.00423					.00383	.00329	.00242	.00148	.00103		.00222		.000840				
ΣE2'	.0466	.0286	.0161					.0156	.0121	.00871	.00543	.00402		.0100		.00371				
2(ΣE2')	.0932	.0572	.0322					.0312	.0242	.0174	.0109	.00804						880		435

TABLE A 4 POINT SOURCE DATA AND CONVERSION TO AREA SOURCE RADIATION

Contaminant: Cesium 137
Wall Thickness: 40 psf
Area of Simulated Unit: 4.46 ft^2

SOURCE POSITIONS (mr/hr)/curie

Dose Rate Contribution Per Row (mr/hr)/(curie/ft^2)

Detector Position	#1	#2	#3	#5	#6	#7	#8	#10	#11	#12	#13	#14		#4	#9	#15	Row A	Row B	Row C
a1	11.1	29.7	45.7	22.9	40.4	46.5	32.8	18.7	28.7	30.7	23.5	16.5		25.3	19.4	11.4			
a2	8.38	9.49	8.69	[illegible]	7.49	6.43	1.50	5.34	5.36	4.53	1.55	9.99		.976	1.11	1.02			
a3	6.99	5.38	3.71	6.61	5.10	3.37	2.30	4.78	4.09	3.24	2.28	1.69		2.20	1.82	1.39			
a4	4.08	1.98	1.09	[illegible]	5.83	2.36	1.37	12.4	7.08	3.72	2.18	1.47		1.03	1.12	1.08	1,350	1,890	1,740
ΣA	32.5	46.5	59.2	[illegible]	58.2	58.7	38.0	41.2	45.2	42.2	29.5	29.6		29.5	23.4	14.5			
2(ΣA)	61.0	93.0	118.4	90.0	116.4	117.4	76.0	82.4	90.4	84.4	59.0	59.2							
b1	33.9	36.0	26.1	24.8	25.9	20.6	12.0	17.4	17.9	5.36	10.6	7.58		12.1	8.41	5.39			
b2	13.2	13.5	11.5	10.0	9.98	8.64	5.89	7.57	6.55	6.06	5.12	1.98		2.64	[illegible]	2.01			
b3	11.8	8.35	5.61	9.29	7.70	5.18	3.43	6.67	6.04	4.61	3.41	2.33		3.26	2.46	[illegible]			
b4	20.7	10.3	4.73	19.2	12.1	7.12	3.76	15.1	10.8	7.08	4.19	3.07		2.70	2.52	2.02			
ΣB	79.0	68.1	47.9	63.1	55.7	41.5	25.1	46.7	41.3	23.1	23.3	15.0		20.7	15.9	11.3	1,830	3,950	1,380
2(ΣB)	158.	136.	95.8	126.	111.	83.0	50.2	93.4	82.6	46.2	46.6	30.0							
C6'	11.7	9.77	7.09	11.1	10.2	7.79	4.92	9.47	8.24	6.28	4.93	3.55		3.81	3.54	2.77			
8(C6')	93.6	78.2	56.7	88.9	81.6	62.3	39.4	75.8	65.9	50.2	39.4	28.4	4 x C6'	15.2	14.2	11.1	1,090	1,280	1,210
C3'	20.5	16.3	10.8	15.0	13.8	9.94	6.09	10.9	9.99	7.57	5.68	3.78		5.66	4.22	3.02			
8(C3')	164.	130.	86.4	120.	110.	79.5	48.7	87.2	79.9	60.6	45.4	30.2	4 x C3'	22.6	16.9	12.1	1,800	1,670	1,400
C0'	12.6	11.6	7.41	13.5	13.2	8.72	5.52	9.93	8.87	6.63	4.88	3.19		4.09	3.69	2.42			
8(C0')	100.	92.8	59.3	108.	105.	69.8	44.2	79.4	71.0	53.0	39.0	25.5	4 x C0'	16.4	14.8	9.68	1,200	1,530	1,240
d1	35.6	22.5	11.0	25.2	21.0	12.8	7.19	17.8	15.4	10.8	7.06	4.86		5.73	4.27	3.24			
d2	21.0	21.3	18.5	14.9	15.9	13.7	8.84	11.2	10.4	9.69	6.82	3.63		5.70	4.58	3.28			
d3	13.2	11.5	8.89	9.83	9.91	7.41	4.98	7.61	7.28	5.67	4.10	3.44		3.34	2.80	2.00			
d4	16.7	[illegible]	6.09	11.2	10.1	6.65	3.85	19.0	7.98	5.93	3.68	2.86		3.47	2.75	1.90			
ΣD	86.5	65.9	44.7	61.1	56.9	40.6	24.7	46.6	41.1	32.1	21.7	14.8		18.2	14.4	10.4	1,840	1,700	1,440
2(ΣD)	173.	132.	89.4	122.	114.	81.2	49.4	93.2	82.2	64.2	43.4	29.6							
e1	19.4	10.8	4.53	34.7	25.0	11.8	5.75	29.9	24.4	14.8	8.07	5.02		2.89	3.72	3.27			
e2	13.3	17.1	18.0	11.4	14.4	12.4	3.68	8.73	10.2	9.07	3.20	2.60		2.73	3.58	3.10			
e3	8.87	8.08	6.68	7.43	7.09	5.72	3.85	5.86	5.34	4.38	3.03	1.58		1.90	1.80	1.53			
e4	9.95	4.87	2.98	8.64	5.97	3.78	2.83	7.55	5.33	3.67	2.64	1.82		1.89	1.71	1.47			
ΣE	51.5	40.8	32.1	62.2	52.5	33.7	15.5	52.0	45.3	31.9	16.9	11.0		9.41	10.8	9.82	1,150	1,510	1,450
2(ΣE)	103.	81.6	64.2	124.	105.	67.4	31.0	104.	90.6	63.8	33.8	22.0							
f1	87.3	26.1	6.48	61.1	36.1	14.5	6.38	35.1	30.8	15.6	10.4	4.95		3.40	3.75	3.08			
f2	16.6	22.3	24.8	12.8	16.3	15.1	4.16	8.79	10.5	9.85	3.38	2.57		3.39	3.80	3.02			
f3	9.80	8.37	6.97	7.63	7.15	5.79	4.12	5.81	5.54	4.37	3.26	1.52		1.95	1.81	1.41			
f4	8.61	5.67	3.15	9.38	6.58	3.89	2.83	7.94	5.57	3.61	2.58	1.74		1.90	1.71	1.38			
ΣF	122.	62.1	41.4	90.9	66.1	39.3	16.9	57.6	52.4	33.4	19.6	10.8		10.6	11.1	8.89	2,060	1,950	1,590
2(ΣF)	244.	125.	82.8	182.	132.	78.6	33.8	115.	105.	66.8	39.2	21.6							

* Note: Correct all cesium 137 data by multiplying by a factor of 0.924. See explanation on the first page of the Appendix.

TABLE A 4 (Continued)

Contaminant: Cesium 137
Wall Thickness: 48 psf
Area of Simulated Unit: 17.8 ft²

Detector Position	SOURCE POSITIONS (mr/hr)/curie																	Dose Rate Contribution Per Row (mr/hr)/(curie/ft²)		
	#16	#17	#18	#20	#21	#22	#23	#25	#26	#27	#28	#29		#19	#24	#30		Row D	Row E	Row F
a_1	14.5	15.9	10.3	8.10	8.00	6.24	4.43	4.74	4.84	4.18	3.23	2.38		5.96	2.97	1.76				
a_2	3.56	2.67	.545	2.33	1.89	.575	.577	1.62	1.33	.451	.419	.489		.912	.683	.533				
a_3	3.30	2.10	1.54	2.20	1.74	1.20	.861	1.57	1.25	.962	.747	.542		.988	.636	.454				
a_4	8.44	3.91	1.81	8.16	3.61	2.07	1.22	4.00	2.92	2.03	1.30	.844		.942	.748	.570				
ΣA	29.8	24.6	14.2	20.8	15.2	10.1	7.09	11.9	10.3	7.62	5.70	4.25		8.80	5.04	3.32		2,600	1,930	1,620
$2(\Sigma A)$	59.6	49.2	28.4	41.6	30.4	20.1	14.2	23.8	20.6	15.2	11.4	6.5								
b_1	10.4	8.70	5.25	5.91	4.98	3.77	2.60	3.62	3.30	2.80	2.13	1.53		3.22	1.79	1.13				
b_2	4.51	3.76	1.50	2.82	2.53	1.32	.966	1.86	1.80	1.48	.687	.668		1.53	1.00	.694				
b_3	4.64	3.09	1.98	2.91	2.15	1.51	1.08	1.92	1.66	1.34	.932	.713		1.28	.811	.556				
b_4	8.61	5.15	-	5.51	3.81	2.39	1.51	3.51	2.82	2.11	1.45	.970		1.56	.967	.691				
ΣB	28.2	20.7	11.3	17.1	13.5	9.59	6.16	10.3	9.58	7.73	5.20	3.88		7.59	4.57	3.07		2,280	1,730	1,360
$2(\Sigma B)$	56.4	41.4	22.6	34.2	27.0	19.2	12.3	20.6	19.1	15.5	10.4	7.76								
C6'	6.77	4.75	3.02	4.28	3.16	2.32	1.64	2.90	2.17	1.73	1.35	1.05		1.96	1.24	.830				
8(C6')	54.2	38.0	24.2	34.2	25.3	18.6	13.1	23.2	17.4	13.8	10.8	8.40	4 x C6'	7.84	4.98	3.32		2,210	1,710	1,370
C3'	6.65	4.78	3.05	4.07	3.33	2.34	1.66	2.60	2.24	1.81	1.43	1.06		1.96	1.23	.817				
8(C3')	53.2	38.2	24.4	32.6	26.6	18.7	13.3	20.8	17.9	14.5	11.4	8.48	4 x C3'	7.84	4.92	3.27		2,210	1,890	1,360
C0'	5.66	4.09	2.54	3.09	2.58	1.55	1.02	2.80	1.73	1.14	.740	.489		1.38	.544	.369				
8(C0')	45.3	32.2	20.3	24.7	20.6	12.4	8.16	22.4	13.8	9.12	5.92	3.91	4 x C0'	5.52	2.18	1.48		1,830	1,210	1,010
d_1	9.46	6.98	3.94	5.83	4.15	3.06	2.10	3.69	3.09	2.41	1.81	1.25		2.27	1.38	.919				
d_2	6.91	5.61	3.82	4.13	3.44	2.62	1.44	2.57	2.23	1.99	1.57	.944		2.26	1.36	.923				
d_3	4.80	3.55	2.43	2.96	2.40	1.87	1.38	2.03	1.60	1.52	1.12	.671		1.39	.901	.627				
d_4	6.08	3.95	2.19	3.62	2.88	1.94	1.32	2.32	2.01	1.56	1.17	.849		1.47	.842	.608				
ΣD	27.2	20.0	12.4	16.5	12.9	9.49	6.24	10.6	9.13	7.48	5.67	3.71		7.39	4.48	3.07		2,260	1,690	1,360
$2(\Sigma D)$	54.4	40.0	24.8	33.0	25.8	19.0	12.5	21.2	18.3	15.0	11.3	7.42								
e_1	16.1	9.78	4.43	9.00	6.77	4.32	2.41	5.34	4.50	3.48	2.35	1.50		2.32	1.48	.987				
e_2	6.49	5.04	1.93	3.89	3.32	1.24	1.34	2.33	2.06	.882	.881	.976		2.25	1.47	.999				
e_3	3.90	3.12	2.02	2.53	1.97	1.57	.774	1.74	1.56	1.30	.885	.567		1.12	.764	.535				
e_4	4.91	3.10	1.72	3.42	2.37	1.53	1.04	2.15	1.84	1.10	.669	1.09		.712	.527					
ΣE	31.4	21.0	10.1	18.8	14.4	8.66	5.56	11.6	9.96	7.15	5.22	3.71		6.78	4.43	3.05		2,350	1,770	1,390
$2(\Sigma E)$	62.8	42.0	20.2	37.6	28.8	17.3	11.1	23.2	19.9	14.3	10.4	7.42								
f_1	16.1	9.23	4.34	8.58	6.11	3.63	2.20	4.96	4.11	3.09	2.09	-		2.00	1.29	.811				
f_2	6.09	5.12	1.79	3.50	2.92	1.13	1.18	2.02	1.91	.811	.735	-		2.06	1.30	.875				
f_3	3.81	2.57	2.03	2.40	1.81	1.46	.690	1.56	1.37	1.16	.959	-		1.03	.660	.474				
f_4	4.88	2.90	1.71	3.12	2.17	1.44	.925	1.93	1.70	1.26	.889	-		.987	.624	.442				
ΣF	30.9	19.8	9.87	17.6	13.0	7.66	4.99	10.5	9.09	6.32	4.67	3.25		6.08	3.67	2.64		2,260	[illegible]	1,250
$2(\Sigma F)$	61.8	39.6	19.7	35.2	26.0	15.3	9.98	21.0	18.2	12.5	9.34	6.50								

* Note: Correct all cesium 137 data by multiplying by a factor of 0.924. See explanation on the first page of the Appendix.

TABLE A 4 (CONTINUED)

Contaminant: Cesium 137
Wall Thickness: 48 psf
Area of Simulated Unit: 71.3 ft²

Detector Position	SOURCE POSITION (mr/hr)/curie 31	32	33	35	36	37	38	40	41	42	43	44		34	39	45		Dose Rate Contribution Per Row (mr/hr)/(curie/ft²) Row G	Row H	Row I
a1	2.51	2.22	1.46											.886	.508	.291				
a2	.892	.276	.296											.363	.240	.163				
a3	.987	.682	.496											.276	.178	.113				
a4	2.04	1.30	.694											.376	.260	.169				
ΣA	6.37	4.41	2.88	3.38	2.70	1.94	1.43	2.44	2.00	1.43	1.12	.880		1.90	1.19	.736		2,080	1,430	1,170
2(ΣA)	12.7	8.82	5.76	6.76	5.40	3.88	2.86	4.88	4.00	2.86	2.24	1.67								
b1	1.98	1.56	1.01											.624	.355	.222				
b2	1.08	.881	.413											.413	.262	.172				
b3	1.11	.816	.530											.337	.209	.134				
b4	1.79	1.27	.733											.422	.271	.170				
ΣB	5.85	4.53	2.69	3.90	3.10	2.06	1.44	2.70	2.20	1.65	1.16	.880		1.80	1.10	.698		1,950	1,580	1,270
2(ΣB)	11.7	9.06	5.38	7.80	6.20	4.12	2.88	5.40	4.40	3.30	2.32	1.76								
C6'	1.56	1.06	.710	.940	.730	.580	.374	.600	.505	.390	.300	.230		.478	.286	.183				
8(C6')	12.5	8.48	5.68	7.52	5.84	4.16	2.99	4.80	4.04	3.12	2.40	1.84	4 x C6'	1.91	1.14	.732		2,040	1,550	1,200
C3'	1.44	1.10	.725	.940	.720	.510	.370	.570	.480	.370	.285	.220		.470	.276	.177				
8(C3')	11.5	8.80	5.80	7.52	5.76	4.08	2.96	4.56	3.84	2.96	2.28	1.76	4 x C3'	1.88	1.10	.708		2,000	1,530	1,150
C0'	.660	.508	.309	.440	.356	.257	.190	.260	.227	.180	.140	.106		.227	.138	.0863				
8(C0')	5.28	4.02	2.47	3.52	2.85	2.06	1.52	2.08	1.82	1.44	1.12	.848	4 x C0'	.908	.552	.345		906	749	545
D1	1.85	1.38	.837											.525	.310	.200				
d2	1.37	1.17	.558											.583	.318	.197				
d3	1.15	.891	.599											.378	.237	.156				
d4	1.31	.984	.597											.389	.236	.153				
ΣD	5.68	4.42	2.59	3.50	2.90	2.10	1.50	2.20	1.93	1.55	1.18	.900		1.81	1.10	.706		1,940	1,580	1,160
2(ΣD)	11.4	8.84	5.18	7.00	5.80	4.20	3.00	4.40	3.86	3.10	2.36	1.80								
E1'	2.71	2.01	1.17											.579	.357	.218				
e2'	1.36	.536	.550											.585	.359	.224				
e3'	.970	.810	.350											.343	.219	.143				
e4'	1.22	.800	.561											.338	.217	.139				
ΣE1'	6.26	4.25	2.63	3.80	3.00	2.16	1.54	2.34	2.00	1.57	1.13	.920		1.84	1.15	.724		1,990	1,580	1,190
2(ΣE1')	12.3	8.50	5.26	7.60	6.00	4.32	3.08	4.68	4.00	3.14	2.26	1.84								
E2'	2.41	1.74	.927											.510	.202	.194				
e2'	1.21	.462	.466											.501	.310	.198				
e3'	.856	.704	.302	1										.295	.194	.127				
e4'	1.09	.825	.460											.301	.188	.129				
ΣE2'	5.56	3.73	2.15	3.26	2.50	1.75	1.27	2.02	1.71	1.30	.960	.785		1.61	.995	.643		1,740	1,330	1,010
2(ΣE2')	11.1	7.46	4.30	6.52	5.00	3.50	2.54	4.04	3.42	2.60	1.92	1.57								

* Note: Correct all cesium 137 data by multiplying by a factor of 0.924. See explanation on the first page of the Appendix.

TABLE A 4 (Continued)

Contaminant: Cesium 137
Wall Thickness: 48 psf
Area of Contaminated Unit: 285 ft²

Detector Position	SOURCE POSITIONS (mr/hr)/curie																	Dose Rate Contribution Per Row (mr/hr)/(curie/ft²)		
	46	47	48	50	51	52	53	55	56	57	58	59		49	54	60		Row J	Row K	Row L
1	.474	.369	.261											.174	.0957	.0592				
2	.206	.0705	.0940											.106	.0626	.0405				
3	.233	.170	.115											.0728	.0422	.0266				
4	.450	.312	.187											.108	.0619	.0408				
5	1.36	.921	.647	.845	.620	.430	.334	.543	.421	.310	.241	.200		.461	.262	.167		1,800	1,350	1,030
(IA)	2.72	1.84	1.29	1.69	1.24	.860	.668	1.09	.842	.620	.482	.400								
1	.387	.321	.214											.137	.0778	.0466				
2	.264	.200	.108											.105	.0614	.0396				
3	.267	.190	.136											.0849	.0504	.0309				
4	.407	.281	.176											.108	.0587	.0388				
5	1.32	.992	.634	.980	.720	.480	.330	.580	.470	.340	.250	.190		.435	.248	.156		1,800	1,500	1,090
(IB)	2.64	1.98	1.27	1.96	1.44	.960	.660	1.16	.940	.680	.500	.390								
6'	.299	.935	.165	.200	.160	.116	.0850	.115	.0980	.0780	.0620	.0490		.112	.0645	.0391				
(6')	2.39	1.88	1.32	1.60	1.28	.928	.680	.920	.784	.624	.496	.392	4 x 06'	.449	.258	.156		1,720	1,358	960
3'	.319	.947	.164	.210	.163	.116	.0840	.130	.108	.0840	.0630	.0490		.107	.0632	.0392				
(C3')	2.55	1.98	1.31	1.68	1.30	.928	.672	1.04	.864	.672	.504	.392	4 x C3'	.321	.253	.157		1,760	1,380	1,030
0'	.130	.108	.0727	.101	.0830	.0614	.0450	.0640	.0560	.0450	.0360	.0280		.0536	.0339	.0221				
(C0')	1.04	.864	.582	.808	.664	.491	.360	.512	.448	.360	.288	.224	4 x C0'	.214	.136	.0884		758	701	547
1	.396	.299	.197											.126	.0739	.0463				
2	.317	.249	.133											.124	.0702	.0457				
3	.264	.218	.144											.0976	.0563	.0349				
4	.308	.237	.149											.0966	.0560	.0360				
5	1.28	1.00	.623	.800	.660	.490	.350	.468	.420	.340	.260	.200		.444	.256	.160		1,780	1,390	1,010
(ID)	2.56	2.00	1.25	1.60	1.32	.980	.700	.936	.840	.680	.520	.400								
[illegible]	.541	.408	.249											.140	.0837	.0530				
[illegible]	.298	.132	.137											.143	.0801	.0521				
[illegible]	.246	.194	.0958											.0888	.0519	.0330				
[illegible]	.317	.207	.152											.0902	.0546	.0346				
[illegible]	1.40	.951	.634	.900	.700	.520	.370	.527	.470	.370	.270	.214		.462	.270	.174		1,830	1,500	1,100
(IE3')	2.80	1.90	1.27	1.80	1.40	1.04	.740	1.05	.940	.740	.540	.428								
[illegible]	.461	.259	.208											.123	.0725	.0446				
[illegible]	.263	.107	.130											.121	.0601	.0436				
[illegible]	.224	.172	.0924											.0804	.0452	.0286				
[illegible]	.270	.208	.129											.0845	.0447	.0821				
[illegible]	1.22	.746	.539	.780	.610	.432	.311	.510	.440	.330	.230	.181		.409	.236	[illegible]		1,540	1,280	1,010
[illegible]	2.44	1.49	1.08	1.56	1.22	.864	.622	1.02	.880	.660	.460	.363								

* Note: Correct all cesium 137 data by multiplying by a factor of C.924
See explanation on the first page of the Appendix.

TABLE A 4 (Continued)

Contaminant: Cesium 137
Wall Thickness: 48 psf
Area of Simulated Unit: 1140 ft²

SOURCE POSITIONS
(mr/hr)/curie

Dose Rate Contribution
Per Row
(mr/hr)/(curie/ft²)

Detector Position	61	62	63	65	56	67	68	70	71	72	73	74		64	69	75		Row M	Row N	Row O
a1	.0966	.0760	.0502											.0336	.0184	.0116				
a2	.0284	.0192	.0239											.0239	.0139	.00911				
a3	.0531	.0413	.0279											.0165	.00922	.00656				
a4	.0940	.0658	.0443											.0246	.0144	.00897				
ΣA	.272	.202	.146	.190	.124	.0770	.0700	.110	.0800	.0630	.0520	.0420		.0986	.0566	.0362		1,540	1,120	832
2(ΣA)	.544	.412	.292	.380	.248	.154	.140	.220	.160	.126	.104	.0840								
b1	.0946	.0662	.0435											.0278	.0154	.00981				
b2	.0699	.0412	.0256											.0234	.0130	.00821				
b3	.0606	.0445	.0288											.0197	.0109	.00721				
b4	.0870	.0642	.0415											.0227	.0133	.00829				
ΣB	.293	.216	.140	.168	.125	.0880	.0640	.110	.0920	.0720	.0520	.0410		.0936	.0526	.0335		1,580		
2(ΣB)	.586	.432	.280	.336	.250	.176	.128	.220	.184	.144	.104	.0820								
C6'	.0648	.0509	.0357	.0370	.0314	.0230	.0176	.0250	.0220	.0176	.0140	.0110		.0238	.0133	.00889				
8(C6')	.499	.402	.286	.296	.251	.184	.141	.200	.176	.141	.112	.0880	4 x C6'	.0952	.0532	.0356		1,460	1,090	858
C3'	.0710	.0538	.0320	.0390	.0315	.0230	.0170	.0250	.0210	.0164	.0133	.0103		.0228	.0129	.00830				
8(C3')	.568	.430	.256	.312	.252	.184	.136	.200	.168	.131	.106	.0824	4 x C3'	.0832	.0516	.0332		1,530	1,070	822
C0'	.0406	.0285	.0207	.0240	.0200	.0143	.0106	.0155	.0135	.0105	.00860	.00660		.0138	.00794	.00567				
8(C0')	.325	.228	.166	.192	.160	.114	.0848	.124	.108	.0840	.0688	.0528	4 x C0'	.0550	.0318	.0227		882	665	524
d1	.0826	.0615	.0416											.0256	.0151	.0100				
d2	.0673	.0519	.0288											.0251	.0144	.00920				
d3	.0590	.0472	.0298											.0209	.0118	.00786				
d4	.0657	.0553	.0335											.0205	.0120	.00779				
ΣD	.280	.216	.134	.158	.127	.0980	.0720	.102	.0900	.0740	.0574	.0442		.0921	.0533	.0348		1,540	1,100	878
2(ΣD)	.560	.432	.268	.316	.254	.196	.144	.204	.180	.148	.115	.0884								
e4'1	.116	.0862	.0557											.0317	.0159	.0105				
e4'2	.0612	.0292	.0298											.0302	.0163	.0103				
e4'3	.0557	.0431	.0231											.0197	.0111	.00730				
e4'4	.0723	.0535	.0377											.0208	.0118	.00788				
ΣE4'	.366	.211	.146	.160	.130	.100	.0760	.100	.0843	.0708	.0540	.0435		.102	.0551	.0360		1,630	1,130	846
2(ΣE4')	.512	.422	.292	.320	.260	.200	.152	.200	.169	.142	.108	.0670								
e2'1	.0991	.0738	.0445											.0264	.0144	.00948				
e2'2	.0576	.0250	.0266											.0257	.0139	.00811				
e2'3	.0511	.0287	.0202											.0176	.0101	.00678				
e2'4	.0647	.0490	.0321											.0187	.0108	.00721				
ΣE2'	.273	.186	.123	.180	.140	.0960	.0680	.106	.0880	.0760	.0490	.0390		.0884	.0492	.0326		1,430	1,160	854
2(ΣE2')	.546	.372	.246	.360	.280	.192	.136	.212	.176	.152	.0980	.0780								

*Note: Correct all cesium 137 data by multiplying by a factor of 0.924
See explanation on first page of the Appendix.

TABLE A 4 (Continued)

Contaminant: Cesium 137
Wall Thickness: 48 psf
Area of Contaminated Unit: 4560 ft[*]

SOURCE POSITIONS
(mr/hr)/curie

Dose Rate Contribution Per Row (mr/hr)/(curie/ft^2)

Detector Position	#76	#77	#78	#80	#81	#82	#83	#85	#86	#87	#88	#89		#79	#84	#90				
a_1	.0185	.0142	.00896											.00589	.00304	-				
a_2	.00487	.00456	.00501											-	.00246	-				
a_3	.0115	.00880	.00997											.00338	.00197	-				
a_4	.0184	.0137	.00852											-	.00867	-		1,220	743	552
ΣA	.0533	.0413	.0289	.0280	.0204	.0156	.0124	.0186	.0137	.0103	.00830	.00690		.0200	.0101	.00580				
2(ΣA)	.107	.0826	.0578	.0560	.0408	.0312	.0248	.0372	.0274	.0206	.0166	.0138								
b_1	.0166	.0127	-											-	.00276	-				
b_2	.0123	.00730	.00528											-	.00237	-				
b_3	.0131	.00976	-											-	.00221	-				
b_4	-	.0122	-											-	.00248	-		1,260	844	584
ΣB	.0600	.0420	.0264	.0330	.0250	.0170	.0124	.0189	.0154	.0116	.00855	.00678		.0195	.00984	.00567				
2(ΣB)	.120	.0840	.0528	.0660	.0500	.0340	.0248	.0378	.0308	.0232	.0171	.0136								
C6′	.0131	.00999	.00675	.00680	.00566	.00430	.00320	.00430	.00380	.00310	.00244	.00195	4 x C6′	.00480	.00250	.00157		1,180	775	597
8(C6′)	.105	.0799	.0540	.0544	.0453	.0344	.0256	.0344	.0304	.0248	.0195	.0156		.0192	.0100	.00628				
C3′	.0140	.0109	.00680	.00780	.00640	.00470	.00340	.00490	.00410	.00330	.00248	.00193	4 x C3′	.00470	.00251	.00157		1,240	857	638
8(C3′)	.112	.0872	.0544	.0624	.0512	.0376	.0272	.0392	.0328	.0264	.0198	.0154		.0188	.0100	.00628				
C0′	.0110	.0811	.00535	.00540	.00445	.00330	.00235	.00340	.00290	.00235	.00180	.00140	4 x C0′	.00332	.00170	.00112		953	597	453
8(C0′)	.0880	.0649	.0428	.0432	.0356	.0264	.0188	.0272	.0232	.0188	.0144	.0112		.0133	.00680	.00448				
d_1	.0175	.0128	-												.00290					
d_2	.0137	.0104	-												.00258					
d_3	.0106	.00958	-												.00224					
d_4	.0137	.0109	-												.00227			1,250	807	588
ΣD	.0555	.0432	.0284	.0280	.0240	.0180	.0133	.0133	.0150	.0122	.00960	.00755		.0193	.00989	.00598				
2(ΣD)	.111	.0864	.0568	.0560	.0480	.0360	.0266	.0340	.0300	.0244	.0192	.0151								
e_1	-	.0153	-																	
e_2	-	.00769	-																	
e_3	-	.00853	-																	
e_4	-	.0111	-															1,190	734	483
ΣE′	.0530	.0406	.0277	.0293	.0210	.0163	.0123	.0141	.0124	.0100	.00790	.00628		.0193	.00940	.00500				
2(ΣE′)	.106	.0812	.0554	.0586	.0420	.0326	.0246	.0282	.0248	.0200	.0158	.0126								
f_1	.0188	.0138	-												.00261					
f_2	.0116	.0961	-												.00255					
f_3	.0110	.00883	-												.00191					
f_4	.0133	.0102	-												.00220			1,160	807	556
ΣF′	.0547	.0396	.0250	.0320	.0240	.0160	.0117	.0180	.0150	.0110	.00800	.00620		.0182	.00327	.00510				
2(ΣF′)	.109	.0772	.0500	.0640	.0480	.0320	.0204	.0360	.0300	.0220	.0160	.0124								

[*] Note: Correct all cesium 137 data by multiplying by a factor of 0.924
See explanation on the first page of the Appendix.

TABLE A 5 POINT SOURCE DATA AND CONVERSION TO AREA SOURCE RADIATION

Contaminant: Cesium 137
Wall Thickness: 93.7 psf
Area of Simulated Unit: 4.94 ft^2

SOURCE POSITIONS
(mr/hr)/curie

Dose Rate Contribution Per Row
(mr/hr)/(curie/ft^2)

Detector Position	1	2	3	5	6	7	8	10	11	12	13	14		4	9	15		Row A	Row B	Row C
a_1	2.61	8.96	13.8	5.19	9.75	18.3	9.16	4.66	7.59	7.65	5.99	3.83		4.69	4.18	2.11				
a_2	2.43	2.55	2.05	1.86	2.85	1.92	.444	1.32	1.58	1.19	.479	.262		.203	.182	1.62				
a_3	1.84	1.17	.772	1.47	1.07	.744	.443	1.08	1.11	.683	.477	.331		.313	.247	.219				
a_4	.788	.365	.225	1.80	.957	.393	.175	2.30	1.51	.533	.357	.223		.186	.179	.166				
ΣA	7.67	13.0	16.8	10.3	14.6	21.4	10.2	9.36	11.8	9.86	7.30	4.65		5.39	4.79	4.12				
2(ΣA)	15.3	26.0	33.6	20.6	29.2	42.8	20.4	18.7	23.6	19.7	14.6	9.30						397	583	445
b_1	9.63	8.93	5.31	6.58	7.00	6.23	2.71	4.33	5.31	3.86	2.58	1.60		1.66	1.30	.922				
b_2	3.53	3.48	2.75	3.63	2.77	3.23	1.28	1.81	2.13	1.63	1.08	.443		.405	.359	.307				
b_3	3.04	1.95	1.18	2.40	1.45	1.24	.736	1.67	1.75	1.09	.732	.422		.455	.360	.289				
b_4	5.13	1.85	.827	4.43	2.63	1.09	.618	3.36	3.12	1.47	.879	.497		.386	.375	.316				
ΣB	21.8	16.2	10.1	16.0	13.9	11.8	5.34	11.2	12.3	8.05	5.27	2.96		2.91	2.39	1.83				
2(ΣB)	43.6	32.4	20.2	32.0	27.8	23.6	10.7	22.4	24.6	16.1	10.5	5.92						490	477	402
C6'	3.07	2.25	1.48	2.78	2.46	1.95	1.05	2.24	2.38	1.60	1.10	.673		.540	.550	.442				
8(C6')	24.6	18.0	11.8	22.2	19.7	15.6	8.40	17.9	19.0	12.8	8.80	5.38	4 x C6'	2.16	2.20	1.77		280	336	325
C3'	6.29	3.99	2.30	4.11	3.42	2.83	1.26	2.76	2.96	1.89	1.29	.771		.834	.658	.486				
8(C3')	50.3	31.9	18.4	32.9	27.4	22.6	10.1	22.1	23.7	15.1	10.3	6.17	4 x C3'	3.34	2.63	1.94		514	472	392
C0'	6.26	4.08	2.28	3.66	3.25	2.63	1.06	2.33	2.63	1.63	1.10	.659		.772	.538	.371				
8(C0')	50.1	32.6	18.2	29.3	26.0	21.0	8.48	18.6	21.0	13.0	8.80	5.27	4 x C0'	3.09	2.15	1.48		514	429	337
d_1	10.0	5.01	2.20	6.93	4.89	3.46	1.27	4.46	4.60	2.55	1.60	.910		.817	.708	.534				
d_2	6.12	5.21	4.06	4.17	3.89	4.11	2.30	3.08	3.25	2.32	1.68	1.00		.851	.666	.528				
d_3	3.85	2.88	1.91	2.68	2.47	2.08	1.19	1.92	2.04	1.25	.919	.603		.459	.391	.309				
d_4	4.09	2.15	1.15	3.20	2.13	1.37	.661	2.36	2.17	1.22	.809	.508		.478	.395	.323				
ΣD	24.1	15.3	9.32	17.0	13.4	11.0	5.42	11.8	12.1	7.34	5.01	3.02		2.60	2.16	1.69				
2(ΣD)	48.2	30.6	18.6	34.0	26.8	22.0	10.8	23.6	24.2	14.7	10.0	6.00						494	473	396
e_1'	5.59	2.27	.901	8.48	4.87	2.44	.895	6.71	5.84	2.75	1.56	.810		.491	.529	.463				
e_2'	3.59	4.67	4.38	2.95	3.55	4.09	1.20	2.14	2.97	2.28	1.10	.596		.511	.543	.453				
e_3'	2.63	2.09	1.56	2.08	1.82	1.49	.801	1.36	1.54	1.09	.799	.395		.288	.267	.231				
e_4'	1.99	.991	5.57	1.93	1.28	.583	.379	1.73	1.48	.742	.491	.362		.281	.269	.229				
ΣE'	13.8	10.0	12.4	15.4	11.5	8.60	3.28	11.9	11.8	6.86	3.95	2.17		1.57	1.61	1.38				
2(ΣE')	27.6	20.0	24.8	30.8	23.0	17.2	6.56	23.8	23.6	13.7	7.90	4.34						366	391	369
[illegible]	12.2	3.43	1.13	11.8	6.06	3.01	1.01	7.99	5.58	3.05	1.68	.859		.560	.571	.486				
[illegible]	4.09	5.45	5.25	3.33	4.04	4.51	1.12	2.38	3.03	2.38	1.12	.621		.558	.572	.470				
[illegible]	2.66	2.08	1.61	2.01	1.78	1.67	.838	1.32	1.49	1.09	.785	.375		.297	.264	.227				
[illegible]	2.31	1.11	5.73	1.99	1.15	.665	.406	1.70	1.47	.772	.497	.365		.288	.258	.231				
[illegible]	21.3	12.1	13.8	19.1	13.0	9.86	3.37	13.4	11.6	7.29	4.08	2.22		1.70	1.67	1.41				
2([illegible])	42.6	24.2	27.6	38.2	26.0	19.7	6.74	26.8	23.2	14.6	8.16	4.44						475	456	388

* Note: Correct all cesium 137 data by multiplying by a factor of 0.924
See explanation on the first page of the Appendix.

TABLE A 5 (Continued)

Contaminant: Cesium 137
Wall Thickness: 93.7 psf
Area of Contaminated Unit: 19.7 ft^2

SOURCE POSITIONS (mr/hr)/curie

Dose Rate Contribution Per Row (mr/hr)/(curie/ft^2)

Detector Position	16	17	18	20	21	22	23	25	26	27	28	29		19	24	30		Row D	Row E	Row F
a1	2.98	3.13	1.62	1.57	2.27	1.62	.907	1.01	1.30	1.06	.741			.901	.566	.333				
a2	.722	.520	.155	.439	.450	.184	.122	.331	.326	.146	.103	.0892		.139	.102	.0862				
a3	.587	.434	.194	.418	.406	.265	.162	.323	.331	.232	.158	.107		.122	.0901	.0799				
a4	1.30	.535	.204	1.08	.755	.412	.228	.831	.660	.405	.237	.152		.115	.111	.0644				
Σa	10.6	4.62	2.17	3.51	3.88	2.48	1.42	2.50	2.62	1.84	1.24			1.28	.869	.584				
2(Σa)	21.6	9.24	4.34	7.92	7.76	4.96	3.84	5.00	5.24	3.69	2.48							719	461	
b1	2.16	1.64	.207	1.19	1.29	.938	.540	.781	.666	.703	.458	.312		.483	.352	.211				
b2	.964	.756	.260	.586	.670	.457	.199	.413	.483	.337	.164	.133		.195	.153	.116				
b3	.857	.560	.291	.584	.569	.357	.220	.440	.383	.298	.202	.138		.177	.118	.0964				
b4	1.46	.836	.343	1.01	.871	.532	.284	.729	.836	.405	.291	.184		.196	.155	.118				
Σb	5.44	3.79	1.10	3.37	3.39	2.28	1.24	2.36	2.43	1.74	1.12	.767		1.05	.778	.541				
2(Σb)	10.9	7.58	2.20	6.74	6.78	4.56	2.48	4.72	4.86	3.48	2.24	1.53						427	420	331
C6°	1.19	.873	.418	.776	.748	.551	.315	.623	.599	.409	.288	.203		.263	.207	.143				
8(C6°)	9.52	6.98	3.34	6.21	5.98	4.41	2.52	4.98	4.79	3.27	2.30	1.62	4 x C6°	1.05	.828	.572		412	392	345
C3°	1.30	.946	.434	.802	.804	.565	.331	.552	.622	.444	.307	.205		.269	.208	.149				
8(C3°)	10.4	7.57	3.47	6.42	6.43	4.52	2.65	4.42	4.98	3.55	2.46	1.64	4 x C3°	1.08	.832	.596		443	406	347
C0°	1.03	.734	.348	.565	.671	.396	.223	.389	.446	.320	.193	.118		.201	.170	.101				
8(C0°)	8.24	5.87	2.78	4.52	5.37	3.17	1.78	3.11	3.57	2.56	1.54	.944	4 x C0°	.804	.680	.404		349	305	238
d1	1.89	1.25	.140	1.14	1.14	.744	.420	.770	.770	.644	.371	.253		.315	.233	.161				
d2	1.34	1.06	.147	.826	.865	.615	.308	.570	.663	.469	.334	.191		.317	.211	.152				
d3	.971	.712	.394	.605	.656	.430	.259	.440	.475	.336	.231	.140		.189	.137	.104				
d4	1.18	.703	.318	.756	.689	.445	.230	.541	.562	.367	.247	.164		.190	.149	.106				
Σd	5.38	3.73	.999	3.33	3.35	2.23	1.22	2.32	2.47	1.78	1.18	.748		1.01	.730	.523				
2(Σd)	10.8	7.46	2.00	6.66	6.70	4.46	2.44	4.64	4.94	3.56	2.36	1.50						420	413	345
[illegible]	2.90	1.59	.147	1.62	1.54	.968	.494	1.09	1.11	.765	.444	.278		.283	.229	.161				
[illegible]	1.23	.981	.328	.739	.771	.372	.244	.519	.579	.422	.201	.173		.295	.224	.151				
[illegible]	.784	.571	.270	.522	.528	.361	.156	.380	.404	.262	.202	.106		.154	.0951	.0896				
[illegible]	.884	.909	.228	.628	.585	.357	.194	.489	.469	.309	.190	.136		.147	.109	.0909				
[illegible]	5.80	3.65	.973	3.51	3.42	2.06	1.09	2.48	2.56	1.78	1.04	.693		.879	.657	.493				
[illegible]	11.6	7.30	1.95	7.02	6.84	4.12	2.18	4.96	5.12	3.56	2.08	1.39						427	410	347
[illegible]	2.98	1.61	1.51	1.70	1.65	.925	.455	1.13	1.16	.775	.442	.281		.290	.242	.154				
[illegible]	1.28	1.03	.352	.775	.771	.363	.240	.534	.567	.417	.195	.168		.398	.207	.152				
[illegible]	.771	.571	.262	.480	.502	.352	.149	.361	.381	.276	.164	[illegible]		.146	.109	.0826				
[illegible]	.988	.495	.219	.617	.567	.343	.188	.470	.459	.293	.197	.0766		.143	.112	.0890				
[illegible]	5.91	3.71	2.34	3.57	3.49	1.98	1.03	2.50	2.57	1.76	.999	.627		.877	.670	.478				
[illegible]	11.8	7.42	4.68	7.14	6.98	3.96	2.06	5.00	5.14	3.52	2.00	1.25						489	410	343

* Note: Correct all cesium 137 data by multiplying by a factor of 0.924. See explanation on the first page of the Appendix.

TABLE A 5 (Continued)

Contaminant Cesium 137
Wall Thickness: 93.7 psf
Area of Contaminated Unit: 79 ft²

Detector Position	SOURCE POSITIONS (mr/hr)/curie																	Dose Rate Contribution Per Row (mr/hr)/(curie/ft²)		
	31	32	33	35	36	37	38	40	41	42	43	44		34	39	45		Row G	Row E	Row I
[illegible]	.567	.435	.317	.318	.349	.256	.169	.199	.241	.189	.137	.0960		.176	.100	.0620				
[illegible]	.168	.0577	.0543	.109	.0610	.0448	.0406	.155	.0439	.0276	.0290	.0302		.0588	.0392	.0297				
[illegible]	.176	.107	.0787	.115	.127	.0765	.0475	.0786	.0845	.0625	.0453	.0324		.0464	.0312	.0205				
[illegible]	.421	.219	.132	.287	.235	.143	.0817	.171	.181	.0125	.0610	.0516		.0610	.0409	.0287				
[illegible]	1.33	.819	.582	.829	.772	.520	.339	.604	.550	.292	.292	.210		.342	.211	.141				
[illegible]	2.66	1.64	1.16	1.66	1.54	1.04	.678	1.21	1.10	.584	.584	.420						458	405	319
[illegible]	.407	.296	.210	.268	.269	.207	.119	.155	.189	.144	.102	.0724		.124	.0735	.0490				
[illegible]	.220	.156	.0832	.143	.146	.0714	.0551	.0908	.111	.0850	.0427	.0392		.0691	.0479	.0332				
[illegible]	.234	.139	.108	.158	.137	.0985	.0660	.102	.107	.0801	.0558	.0401		.0634	.0394	.0284				
[illegible]	.387	.241	.148	.260	.231	.146	.0895	.154	.172	.0410	.0827	.0534		.0745	.0485	.0328				
[illegible]	1.25	.832	.550	.829	.783	.523	.330	.503	.579	.350	.283	.205		.331	.209	.143				
2(ΣB)	2.50	1.66	1.10	1.66	1.57	1.05	.660	1.11	1.16	.700	.566	.410						442	407	323
C6'	.334	.200	.140	.204	.184	.132	.0883	.128	.139	.102	.0730	.0532		.0826	.0538	.0362				
S(C6')	2.67	1.60	1.12	1.63	1.47	1.06	.706	1.02	1.11	.816	.584	.426	4 x C6'	.330	.215	.145		452	401	324
C3'	.296	.206	.147	.191	.193	.133	.0912	.127	.142	.105	.0759	.0529		.110	.0545	.0357				
S(C3')	2.37	1.65	1.18	1.53	1.54	1.06	.730	1.02	1.14	.840	.607	.423	4 x C3'	.440	.218	.143		446	401	329
C3'	.189	.163	.0868	.122	.128	.0724	.0451	.0700	.0805	.0583	.0412	.0350		.0499	.0325	.0220				
S(C3')	1.51	1.30	.694	.976	1.02	.579	.361	.560	.644	.466	.330	.280	4 x C3'	.200	.130	.0680		292	243	187
[illegible]	.419	.261	.174	.257	.248	.301	.105	.173	.181	.136	.0947	.0639		.0996	.0588	.0409				
[illegible]	.315	.207	.126	.165	.193	.137	.0789	.120	.135	.104	.0761	.0491		.0938	.0607	.0391				
[illegible]	.228	.221	.115	.152	.152	.107	.0686	.103	.113	.0890	.0585	.0386		.0648	.0432	.0294				
d4	.280	.188	.127	.191	.178	.116	.0770	.135	.136	.0987	.0665	.0484		.0654	.0456	.0305				
ΣD	1.24	.877	.542	.765	.771	.661	.330	.531	.567	.428	.296	.200		.324	.208	.140				
2(ΣD)	2.48	1.75	1.08	1.57	1.54	1.32	.660	1.06	1.13	.856	.592	.400						445	419	330
[illegible]	.531	.332	.209	.331	.319	.207	.118	.210	.236	.171	.114	.0731		.0776	.0621	.0449				
[illegible]	.280	.119	.114	.175	.112	.0833	.0743	.112	.107	.0574	.0490	.0491		.0770	.0633	.0418				
[illegible]	.192	.132	.0700	.142	.131	.0923	.0463	.0963	.0966	.0764	.0421	.0338		.0557	.0360	.0271				
[illegible]	.271	.159	.117	.186	.171	.109	.0712	.128	.127	.0931	.0618	.0470		.0612	.0382	.0310				
[illegible]	1.27	.742	.510	.834	.733	.492	.310	.546	.567	.398	.267	.203		.312	.200	.145				
[illegible]	2.54	1.48	1.02	1.67	1.47	.984	.620	1.09	1.13	.796	.534	.406						423	390	324
[illegible]	.569	.348	.211	.342	.326	.216	.123	.208	.240	.175	.114	.0721		.0973	.0602	.0439				
[illegible]	.285	.116	.101	.172	.109	.0797	.0728	.108	.107	.0599	.0476	.0487		.0937	.0599	.0405				
[illegible]	.186	.128	.0706	.139	.129	.0876	.0443	.0807	.0960	.0685	.0390	.0330		.0543	.0348	.0260				
[illegible]	.248	.154	.107	.158	.162	.108	.0671	.112	.121	.0917	.0633	.0432		.0588	.0362	.0272				
[illegible]	1.29	.746	.490	.811	.726	.491	.307	.509	.564	.395	.264	.197		.304	.191	.138				
[illegible]	2.58	1.49	.980	1.62	1.45	.982	.614	1.02	1.13	.790	.528	.394						423	384	316

* Note: Correct all cesium 137 data by multiplying by a factor of 0.924.
See explanation on the first page of the Appendix.

TABLE A 5 (Continued)

Contaminant: Cesium 137
Wall Thickness: 93.7 psf
Area of Contaminated Unit: 316 ft²

Detector Position	SOURCE POSITIONS (mr/hr)/curie 46	47	48	50	51	52	53	55	56	57	58	59		49	54	60		Dose Rate Contribution Per Row (mr/hr)/(curie/ft²) Row J	Row K	Row L
A1	.113	.0895	.0553	.0668	.0686	.0489	.0293	.0464	.0463	.0374	.0270	.0196		.0369	.0200	.0119				
a2	.0415	.0165	.0172	.0257	.0149	.0116	.0124	.0170	.0103	.00828	.00807	.00857		.0188	.0121	.00733				
a3	.0487	.0408	.0218	.0280	.0291	.0190	.0136	.0201	.0222	.0161	.0120	.00852		.0139	.00817	.00525				
a4	.102	.133	.0369	.0575	.0510	.0373	.0229	.0406	.0409	.0307	.0211	.0137		.0191	.0121	.00756				
ΣA	.205	.280	.132	.178	.170	.117	.0782	.134	.120	.0925	.0682	.0500		.0887	.0415	.0320				
Σ(ΣA)	.610	.560	.264	.356	.340	.234	.156	.248	.240	.185	.136	.100						480	357	297
b1	.0219	.0338	.0472	.0582	.0555	.0389	.0261	.0372	.0299	.0140	.0219	.0165		.0257	.0158	.00986				
b2	.0943	.0256	.0399	.0329	.0350	.0172	.0155	.0227	.0244	.0163	.0106	.0100		.0240	.0128	.00808				
b3	.0508	.0389	.0274	.0382	.0432	.0258	.0169	.0257	.0263	.0194	.0236	.0106		.0176	.0103	.00709				
b4	.0983	.0670	.0370	.0556	.0541	.0375	.0230	.0378	.0381	.0302	.0204	.0131		.0212	.0110	.00793				
Σb	.258	.205	.151	.185	.188	.119	.0815	.123	.119	.0799	.0765	.0502		.0885	.0499	.0330				
Σ(Σb)	.516	.410	.302	.370	.376	.238	.163	.246	.238	.160	.153	.100						417	379	294
C6'	.0710	.0516	.0342	.0441	.0463	.0308	.0217	.0320	.0273	.0242	.0181	.0138		.0236	.0142	.00841				
Σ(C6')	.568	.413	.274	.353	.370	.246	.174	.240	.218	.194	.145	.110	4 x C6'	.0944	.0568	.0336		427	379	297
C3'	.0755	.0553	.0335	.0483	.0464	.0322	.0138	.0316	.0317	.0246	.0181	.0132		.0227	.0138	.00797				
Σ(C3')	.604	.442	.268	.386	.371	.258	.110	.253	.254	.197	.145	.106	4 x C3'	.0908	.0552	.0319		442	373	312
C0'	.0415	.0130	.0214	.0259	.0258	.0160	.0126	.0174	.0189	.0138	.0102	.00800		.0138	.00876	.00519				
Σ(C0')	.332	.104	.171	.207	.206	.128	.101	.139	.151	.110	.0816	.0640	4 x C0'	.0552	.0350	.0208		209	212	179
D1	.0755	.0553	.0335	.0558	.0534	.0377	.0253	.0386	.0393	.0304	.0220	.0150		.0227	.0143	.00892				
d2	.0122	.0836	.0472	.0428	.0278	.0301	.0187	.0294	.0299	.0140	.0156	.0119		.0257	.0142	.00860				
d3	.0582	.0436	.0287	.0380	.0396	.0262	.0155	.0139	.0258	.0212	.0146	.00999		.0186	.0129	.00786				
d4	.0721	.0505	.0319	.0450	.0460	.0287	.0157	.0321	.0328	.0249	.0245	.0122		.0196	.0114	.00775				
ΣD	.218	.233	.141	.182	.167	.123	.0758	.114	.128	.0905	.0767	.0491		.0866	.0528	.0325				
Σ(ΣD)	.436	.466	.282	.364	.334	.246	.158	.228	.256	.181	.153	.0982						401	363	300
E1'	.0710	.0516	.0342	.0675	.0711	.0461	.0283	.0490	.0494	.0367	.0253	.0169		.0236	.0152	.00908				
e1'	.0947	.0656	.0461	.0365	.0253	.0191	.0183	.0272	.0172	.0135	.0129	.0122		.0282	.0150	.00964				
e1'	.0523	.0389	.0199	.0342	.0350	.0233	.0129	.0236	.0238	.0185	.00959	.00866		.0167	.00958	.00678				
e1'	.0720	.0497	.0307	.0564	.0449	.0305	.0197	.0339	.0315	.0246	.0187	.0128		.0190	.0114	.00811				
ΣE1'	.290	.206	.131	.197	.176	.119	.0792	.134	.122	.0933	.0669	.0506		.0875	.0512	.0334				
Σ(ΣE1')	.580	.412	.262	.394	.352	.238	.158	.268	.244	.187	.134	.101						423	376	306
E2'	.0122	.0836	.0472	.0735	.0787	.0461	.0284	.0503	.0491	.0384	.0253	.0169		.0257	.0144	.00868				
e2'	.0608	.0292	.0262	.0372	.0239	.0184	.0169	.0264	.0167	.0127	.0115	.0117		.0245	.0156	.00912				
e2'	.0501	.0340	.0187	.0308	.0347	.0219	.0123	.0229	.0212	.0182	.00943	[illegible]		.0265	.00887	.00645				
e2'	.0703	.0498	.0296	.0433	.0422	.0290	.0189	.0292	.0303	.0240	.0185	[illegible]		.0177	.0112	.00758				
ΣE2'	.193	.197	.122	.185	.174	.115	.0765	.129	.117	.0933	.0647	[illegible]		.0944	.0501	.0320				
Σ(ΣE2')	.386	.394	.244	.370	.348	.230	.153	.258	.234	.187	.129	[illegible]						353	353	297

* Note: Correct all cesium 137 data by multiplying by a factor of 0.924. See explanation on the first page of the Appendix.

TABLE A 5 (Continued)

Contaminant: Cesium 137
Wall Thickness: 93.7 psf
Area of Contaminated Unit: 1260 ft²

Detector Position	61	62	63	65	66	67	68	70	71	72	73	74		64	69	75		Row M	Row N	Row O
	SOURCE POSITIONS (mr/hr)/curie																	Dose Rate Contribution Per Row (mr/hr)/(curie, ft²)		
a_1	.0298	.0186	.00915	.0169	.0133	.00935	.00645	.0101	.00883	.00686	.00449	.00322		.00713	.00383	.00204				
a_2	.00758	.00435	.00385	.00676	.00339	.00418	.00289	.00458	.00218	.00190	.00165	.00235		.00400	.00251	.00171				
a_3	.0129	.00794	.00439	.00858	.00681	.00277	.00388	.00510	.00507	.00352	.00220	.00226		.00282	.00194	.000891				
a_4	.0871	.0147	.00724	.0157	.0125	.00819	.00501	.00972	.00904	.00620	.00379	.00242		.00441	.00252	.001				
ΣA	.149	.0456	.0247	.0479	.0360	.0245	.0174	.0295	.0251	.0185	.0121	.0103		.0184	.0108	.00637				
2(ΣA)	.298	.0912	.0494	.0958	.0720	.0490	.0348	.0590	.0502	.0370	.0242	.0206						576	330	248
b_1	.0264	.0159	.00736	.0133	.0116	.00782	.00473	.00885	.00768	.00610	.00383	.00287		.00589	.00331	.00192				
b_2	.0176	.00831	.00429	.00981	.00760	.00418	.00340	.00617	.00567	.00300	.00214	.00189		.00410	.00256	.00138				
b_3	.0191	.00976	.00859	.0111	.00856	.00593	.00403	[illegible]	.00647	.00523	.00280	.00208		.00396	.00282	.00168				
b_4	.0256	.0153	.00740	.0147	.0115	.00818	.00502	.00910	.00804	.00618	.00378	.00260		.00470	.00284	.00189				
ΣB	.0889	.0493	.0276	.0489	.0393	.0261	.0172	.0312	.0279	.0205	.0126	.00944		.0187	.0115	.00687				
2(ΣB)	.178	.0986	.0552	.0978	.0786	.0522	.0344	.0624	.0558	.0410	.0252	.0189						425	347	256
C6'	.0199	.0127	.00593	.0119	.0101	.00730	.00490	.00743	.00704	.00492	.00338	.00256		.00480	.00333	.00177				
8(C6')	.159	.102	.0474	.0952	.0808	.0584	.0392	.0594	.0563	.0394	.0270	.0205	4 x C6'	.0192	.0133	.00708		413	362	265
C3'	.0222	.0125	.00674	.0129	.00973	.00620	.00457	.00774	.00694	.00505	.00348	.00247		.00494	.00280	.00155				
8(C3')	.178	.150	.0539	.103	.0778	.0496	.0366	.0619	.0555	.0404	.0278	.0198	4 x C3'	.0198	.0112	.00620		[illegible]	350	267
C0'	.0131	.00726	.00446	.00795	.00665	.00445	.00272	.00523	.00511	.00322	.00209	.00230		.00308	.00183	.00128				
8(C0')	.105	.0581	.0357	.0636	.0532	.0356	.0218	.0418	.0409	.0258	.0167	.0184	4 x C0'	.0123	.00732	.00512		266	229	188
d_1	.0267	.0150	.00777	.0148	.0113	.00781	.00519	.00934	.00748	.00602	.00371	.00265		.00531	.00314	.00166				
d_2	.0204	.0115	.00544	.0118	.00911	.00631	.00416	.00724	.00667	.00469	.00272	.00217		.00465	.00266	.00171				
d_3	.0131	.0100	.00874	.0110	.00799	.00584	.00361	.00671	.00616	.00425	.00281	.00265		.00389	.00250	.00147				
d_4	.0216	.0122	.00656	.0122	.0103	.00693	.00443	.00764	.00750	.00605	.00328	.00237		.00420	.00277	.00188				
ΣD	.0820	.0487	.0285	.0498	.0387	.0269	.0174	.0309	.0278	.0210	.0125	.00984		.0183	.0111	.00672				
2(ΣD)	.154	.0974	.0570	.0996	.0774	.0538	.0348	[illegible]	.0556	.0420	.0250	.0197						425	349	266
E4'	.0323	.0186	.00835	.0174	.0139	.00931	.00592	.00110	.00944	.00720	.00433	.00290		.00544	.00307	.00163				
$e4_1'$	.0175	.00671	.00493	.0101	.00535	.00443	.00378	.00646	.00410	.00286	.00230	.00222		.00543	.00317	.00204				
$e4_2'$	.0154	.00856	.00393	.00955	.00775	.00518	.00300	.00631	.00560	.00376	.00202	.00242		.00413	.00215	.00136				
$e4_3'$	.0226	.0127	.00745	.0134	.0108	.00753	.00503	.00872	.00736	.00951	.00387	.00273		.00496	.00306	.00169				
ΣE4'	.0978	.0466	.0247	.0505	.0378	.0265	.0177	.0226	.0265	.0233	.0125	.0103		.0200	.0115	.00672				
2(ΣE4')	.176	.0932	.0494	.101	.0756	.0530	.0354	.0452	.0530	.0466	.0250	.0206						427	345	248
E2'	.0335	.0185	.00865	.0178	.0143	.00961	.00590	.00119	.00979	.00735	.00433	.00286		.00534	.00309	.00164				
$e2_1'$	.0162	.00664	.00476	.00963	.00515	.00421	.00372	.00599	.00386	.00288	.00221	.00214		.00503	.00298	.00169				
$e2_2'$	.0177	.00813	.00389	.00902	.00706	.00501	.00281	.00622	.00545	.00383	.00191	.00232		.00347	.00210	.00150				
$e2_3'$	.0221	.0127	.00668	.0130	.0105	.00747	.00501	.00837	.00738	.00572	.00387	.00274		.00471	.00304	.00161				
ΣE2'	.0895	.0460	.0240	.0495	.0370	.0263	.0174	.0218	.0265	.0198	.0123	.0101		.0186	.0112	.00644				
2(ΣE2')	.179	.0920	.0480	.0990	.0740	.0526	.0348	.0436	.0530	.0396	.0246	.0202						426	343	236

* Note: Correct all cesium 137 data by multiplying by a factor of 0.924.
See explanation on the first page of the Appendix.

TABLE A [illegible] POINT SOURCE DATA AND CONVERSION TO AREA SOURCE RADIATION

* Note: Correct all cesium 137 data by multiplying by a factor of 0.924. See explanation on the first page of the Appendix.

Contaminant: Cesium 137
Wall Thickness: 139 psf
Area of Contaminated Unit: 2.44 ft² (Position α - ε); 4.46 ft² (Position 5 - 15)

SOURCE POSITIONS (mr/hr)/curie

Dose Rate Contribution Per Row (mr/hr)/(curie/ft²)

Position Detector	α	β	γ	δ	5	6	7	8	10	11	12	13	14		ε	9	15	Row A	Row B	Row C
[illegible]	.296	.826	1.74	1.25	.704	1.78	2.53	1.53	1.11	1.89	2.22	1.75	.921		.455	.733	.531			
[illegible]	.432	.527	.524	2.00	.380	.438	.346	.109	.358	.390	.319	.139	.058		.021	.036	.033			
[illegible]	.331	.251	.146	.093	.320	.202	.128	.072	.297	.217	.150	.097	.052		.031	.040	.035			
[illegible]	.454	.687	.428	.027	.230	.099	.051	.029	.449	.197	.941	.054	.035		.026	.032	.032			
[illegible]	1.513	2.231	2.849	3.342	1.634	2.529	3.055	1.740	2.214	2.694	3.630	2.040	1.076		.533	.842	.631			
2(IA)	3.03	4.58	5.68	6.69	3.27	5.04	6.11	3.48	4.43	5.39	7.26	4.08	2.13					45.1	83.6	107
[illegible]	1.51	.190	1.39	.658	1.34	1.64	.126	.524	1.22	1.29	1.09	.642	.348		.171	.234	.102			
[illegible]	.741	.728	.674	.395	.532	.595	.483	.345	.454	.558	.430	.280	.101		.041	.067	.058			
[illegible]	.580	.495	.231	.144	.487	.376	.208	.107	.452	.383	.232	.150	.073		.047	.060	.052			
[illegible]	.831	.369	.157	.770	.866	.434	.183	.081	.493	.598	.316	.154	.075		.047	.061	.058			
[illegible]	3.663	1.712	2.452	1.977	3.244	3.043	1.002	.9570	3.129	2.839	2.078	1.239	.5970		.306	.367	.270			
[illegible]	7.32	3.42	4.90	3.93	6.49	6.09	2.00	1.91	6.24	5.66	4.14	2.45	1.19					48.6	75.2	89.0
[illegible]	.592	.430	.284	.152	.507	.435	.262	.138	.557	.484	.360	.214	.109		.048	.076	.071			
[illegible]	4.74	3.44	2.87	1.22	4.06	3.48	2.19	1.10	4.46	3.87	2.88	1.71	.872	4xC6	.194	.304	.286	29.0	49.1	62.9
[illegible]	1.13	.903	.552	.287	.860	.786	.452	.202	.764	.715	.488	.264	.133		.081	.105	.085			
[illegible]	9.04	7.22	4.49	2.30	6.88	5.81	3.62	1.62	6.11	5.72	3.90	2.11	1.06	4xC3	.326	.420	.341	57.1	82.1	85.6
[illegible]	1.24	.973	.565	.310	.821	.654	.380	.190	.628	.610	.407	.232	.115		.080	.094	.070			
[illegible]	9.92	7.78	4.52	2.48	6.57	5.23	3.04	1.52	5.02	4.88	3.26	1.86	.920	4xC0	.318	.374	.280	68.1	85.2	72.[illegible]
[illegible]	1.71	1.13	.477	.508	1.36	1.03	.477	.193	1.37	1.05	.604	.328	.148		.086	.111	.098			
[illegible]	1.10	1.22	1.03	.103	.869	.928	.682	.151	.735	.847	.693	.409	.194		.083	.119	.097			
[illegible]	.729	.634	.464	.288	.603	.519	.345	.179	.523	.499	.359	.225	.107		.047	.066	.056			
[illegible]	.742	.469	.224	.119	.690	.426	.215	.104	.620	.474	.282	.162	.080		.050	.062	.056			
[illegible]	4.281	3.458	2.195	1.02	3.515	2.903	1.72	.827	3.25	2.87	1.86	1.124	.529		.267	.357	.307			
[illegible]	8.56	6.91	4.39	2.04	7.02	5.81	3.44	1.65	6.50	5.74	3.72	2.25	1.06					54.9	81.5	87.2
[illegible]	1.65	.357	.151	.077	1.32	.725	.286	.109	1.67	1.17	.604	.260	.122		.060	.082	.081			
[illegible]	.566	.634	.408	.580	.534	.720	.720	.247	.531	.692	.618	.306	.131		.050	.092	.079			
[illegible]	.506	.797	.360	.215	.415	.415	.258	.147	.393	.392	.285	.185	.085		.029	.047	[illegible]			
[illegible]	.331	.171	.107	.061	.354	.191	.108	.056	.408	.251	.150	.088	.050		.032	.040	.039			
[illegible]	3.05	1.96	1.086	.933	2.623	2.05	1.37	.559	3.00	2.503	1.66	.839	.387		.171	.260	.241			
[illegible]	6.10	3.92	2.06	1.87	5.25	4.10	2.74	1.12	6.00	5.01	3.32	1.68	.774					34.4	60.1	76.0
[illegible]	1.69	.587	.198	.087	2.27	.112	.366	.130	2.23	1.45	.657	.255	.131		.0658	.0851	.0851			
[illegible]	.628	1.02	.124	.775	.640	.857	.845	.275	.580	.767	.647	.331	.148		.0621	.102	.0842			
[illegible]	.511	.460	.384	.233	.438	.388	.277	.151	.390	.363	.287	.177	.098		.0297	.0465	.0406			
[illegible]	.379	.196	.112	.636	.398	.206	.114	.057	.429	.259	.155	.098	.049		.0336	.0415	.0387			
[illegible]	3.208	2.26	.819	1.73	3.746	1.563	1.60	.614	3.63	2.837	1.746	[illegible]	.427		.191	.275	.248			
[illegible]	6.41	4.52	1.64	3.46	7.49	3.11	3.20	1.23	7.26	5.67	3.49	[illegible]	.854					39.5	68.3	85.8
[illegible]	.878	.747	.451	.234	.791	.613	.402	.184	.719	.618	.450	[illegible]	.127		.071	[illegible]	.402			
[illegible]	7.02	5.98	3.61	1.87	6.33	4.90	3.22	1.47	5.75	4.94	3.60	2.14	1.02	4xC4	[illegible]	.361	.329	45.9	72.7	79.3
[illegible]	1.32	1.23	.571	.407	.924	.755	.450	.224	.766	.709	.471	.173	.133		.082	.105	.085			
[illegible]	10.6	8.74	4.57	3.26	7.39	6.04	3.60	1.63	6.13	5.67	3.77	1.38	1.06	4xC2	.326	.420	.349	65.9	85.1	81.8
[illegible]	1.29	1.08	.567	.309	.946	.790	.448	.232	.721	.698	.457	.260	.127		.088	.100	.083			
[illegible]	10.3	8.69	4.64	2.47	7.57	6.32	3.58	1.62	5.77	5.58	3.66	2.08	1.02	4xC1	.351	.100	.333	63.4	86.9	82.2

TABLE A 6 (Continued)

* Note: Correct all cesium 137 data by multiplying by a factor of 0.924. See explanation on the first page of the Appendix.

Contaminant: Cesium 137
Wall Thickness: 139 psf
Area of Simulated Unit: 17.8 ft²

	Determined Graphically							SOURCE POSITIONS (mr/hr)/curie						Determined Graphically				Dose Rate Contribution Per Hour (mr/hr)/(curie/ft^2)		
Detector Position	16	17	18	20	21	22	23	25	26	27	28	29		19	24	30		Row D	Row E	Row F
[illegible]	1.06	1.19	.592					.352	.379	.196	.180	.115		.260		.0836				
[illegible]	.251	.200	.0591					.101	.091	.0440	.025	.0197		.0281		.0193				
[illegible]	.226	.125	.0555					.0939	.083	.0740	.031	.0202		.0289		.0156				
[illegible]	.439	.134	.0494					.257	.165	.0881	.045	.0270		.0301		.0187				
[illegible]	1.976	1.649	.756	.800	1.02	.540	.300	.803	.719	.402	.281	.182		.347	.200	.137				
[illegible]	3.95	3.30	1.51	1.60	2.04	1.08	.600	1.61	1.44	.804	.562	.364						162	98.3	87.4
[illegible]	.801	.615	.268					.268	.265	.185	.105	.0656		.118		.0509				
[illegible]	.362	.270	.0863					.134	.131	.0908	.0408	.0287		.0498		.0264				
[illegible]	.307	.186	.0816					.170	.113	.0745	.0432	.0282		.0439		.0223				
[illegible]	.628	.181	.0945					.238	.187	.105	.0564	.0356		.0495		.0258				
[illegible]	2.10	1.25	.530	1.00	.700	.380	.230	.810	.696	.455	.245	.158		.261	.174	.125				
[illegible]	4.20	2.50	1.06	2.00	1.40	.760	.460	1.60	1.39	.910	.490	.316						143	85.3	86.3
C6'	.428	.280	.120	.260	.230	.0980	.0650	.170	.154	.112	.0631	.0409		.0579	.0430	.0316				
(C6')	3.42	2.24	.960	2.08	1.84	.784	.520	1.36	1.23	.896	.505	.327	4xC6	.232	.172	.126		119	96.1	79.0
C3'	.520	.328	.136	.267	.242	.100	.0620	.183	.165	.118	.0634	.0409		.0604	.0435	.0331				
(C3')	4.16	2.62	1.09	2.14	1.94	.800	.496	1.46	1.32	.944	.507	.327	4xC3	.242	.172	.132		144	98.8	83.5
C0'	.397	.244	.104	.188	.176	.0700	.0440	.133	.120	.1866	.0448	.0280		.0520	.0320	.0223				
(C0')	3.18	1.95	.832	1.50	1.41	.560	.352	1.06	.960	.693	.358	.224	4xC0	.208	.128	.089		110	70.3	60.2
[illegible]	.769	.416	.168					.271	.225	.152	.0818	.0497		.0775		.0364				
[illegible]	.497	.414	.173					.183	.179	.121	.0734	.0421		.0801		.0373				
[illegible]	.379	.250	.109					.140	.122	.0852	.0504	.0219		.0462		.0248				
[illegible]	.436	.222	.0866					.170	.143	.0894	.0484	.0521		.0484		.0258				
[illegible]	2.07	1.30	.537	1.16	.900	.470	.270	.764	.669	.448	.253	.166		.252	.180	.124				
[illegible]	4.14	2.60	1.07	2.32	1.80	.940	.540	1.52	1.33	.896	.506	.332						144	103	84.0
[illegible]	1.10	.507	.169					.369	[illegible]	.188	.0951	.0474		.0739		.0373				
[illegible]	.457	.361	.118					.162	.158	.0837	.0517	.0378		.0703		.0373				
[illegible]	.293	.200	.085					.116	.110	.0692	.0448	.0217		.0353		.0201				
[illegible]	.336	.128	.057					.142	.113	.0740	.0428	.0248		.0355		.0183				
[illegible]	2.106	1.196	.430	1.20	.780	.380	.225	.789	.668	.415	.234	.132		.215	.175	.113				
[illegible]	4.37	2.39	.860	2.40	1.56	.760	.450	1.58	1.33	.830	.466	.264						140	95.2	81.3
[illegible]	1.29	.564	.181					.406	.327	.188	.0951	.0554		.0754		.0366				
[illegible]	.462	.383	.117					.160	.160	.0844	.0504	.0362		.0720		.0376				
[illegible]	.269	.189	.082					.113	.099	.159	.0488	.0217		.0340		.0191				
[illegible]	.316	.149	.056					.145	.113	.0698	.0373	.0243		.0342		.0185				
[illegible]	2.337	1.285	.437	1.30	.900	.350	.220	.824	.699	.501	.232	.138		.216	.175	.112				
[illegible]	4.67	2.57	.874	2.60	1.80	.700	.440	1.64	1.39	1.00	.464	.276						148	102	87.2
[illegible]	.469	.329	.134	.277	.226	.140	.0760	.195	.168	.119	.0635	.0414		.0692	[illegible]	.0332				
[illegible]	3.75	2.63	1.07	2.22	1.81	1.12	.608	1.56	1.34	.952	.508	.331	4xC4	.277	.172	.133		138	106	85.8
[illegible]	.501	.308	.126	.272	.216	.136	.0760	.177	.155	.104	.0564	.0385		.0660	.0430	.0298				
[illegible]	4.01	2.46	2.01	2.18	1.73	1.09	.608	1.42	1.24	.832	.451	.308	4xC4	.264	.172	.119		138	103	77.8
C1'	.473	.297	.122	.245	.190	.115	.0650	.162	.140	.093	.0538	.0337		.0605	.0380	.0271				
(C1')	3.78	2.38	.976	1.96	1.52	.920	.520	1.30	1.12	.750	.430	.270	4xC1	.242	.152	.108		131	90.2	70.8

TABLE A 6 (Continued)

* Note: Correct all cesium 137 data by multiplying by a factor of 0.924. See explanation on the first page of the Appendix.

Contaminant: Cesium 137
Wall Thickness: 139 psf
Area of Simulated Unit: 71.3

	DETERMINED GRAPHICALLY							SOURCE POSITIONS (mr/hr)/curie						DETERMINED GRAPHICALLY				Dose Rate Contribution Per Row (mr/hr)/(curie/ft²)		
Detector Position	31	32	33	35	36	37	38	40	41	42	43	44		34	39	45		Row G	Row H	Row I
[illegible]								[illegible]	.0665	.0407	.0316	.0214				.0159				
[illegible]								.0250	.0138	.00871	.00721	.00673				.00649				
[illegible]								.0256	.0218	.0127	.00941	.00649				.00493				
[illegible]								.0639	.0465	.0247	.0166	.0102				.00613				
E1	.440	.270	.130	.250	.193	.107	.0660	.189	.151	.0868	.0650	.0444		.0770	.0480	.0334				
S(E1)	.880	.540	.260	.500	.386	.214	.132	.378	.302	.174	.130	.0890						125	91.3	79.1
[illegible]								.0605	.0527	.0304	.0220	.0151				.0103				
[illegible]								.0329	.0283	.0187	.0102	.00853				.00747				
[illegible]								.0261	.0272	.0178	.0104	.00840				.00616				
[illegible]								.0565	.0331	.0247	.0171	.0109				.00680				
E3	.450	.215	.115	.320	.170	.0940	.0600	.176	.141	.0816	.0597	.0429		.0720	.0450	.0306				
S(E3)	.900	.430	.230	.640	.340	.188	.120	.352	.282	.183	.119	.0858						116	94.8	74.9
C6'	.104	.0670	.0350	.0610	.0460	.0310	.0160	.0431	.0358	.0223	.0151	.0106		.0180	.0110	.00767				
S(C6')	.832	.536	.280	.488	.368	.248	.128	.345	.286	.178	.121	.0848	4xC6	.0720	.0440	.0307		123	91.3'	74.9
C3'	.110	.0720	.0380	.0660	.0490	.0310	.0161	.0431	.0363	.0236	.0161	.0107		.0180	.0120	.00771				
S(C3')	.880	.576	.304	.528	.392	.248	.128	.345	.290	.189	.129	.0856	4xC3	.0720	.0480	.0308		130	95.5	76.3
C0'	.0750	.0430	.0230	.0440	.0340	.0210	.0110	.0293	.0228	.0141	.0100	.00740		.0134	.00800	.00556				
S(C0')	.600	.352	.184	.352	.272	.168	.0880	.234	.182	.119	.0800	.0592	4xC0	.0520	.0320	.0222		87.7	65.0	45.6
[illegible]								.0586	.0475	.0320	.0208	.0135				.00830				
[illegible]								.0432	.0370	.0247	.0155	.0101				.00888				
[illegible]								.0343	.0283	.0192	.0125	.00838				.00680				
[illegible]								.0434	.0340	.0210	.0143	.00964				.00670				
[illegible]	.440	.290	.130	.260	.200	.120	.0660	.179	.147	.0966	.0627	.0416		.0740	.0660	.0307				
[illegible]	.880	.580	.260	.520	.400	.240	.132	.358	.294	.1938	.1252	.0832						128	97.0	77.7
[illegible]								.0752	.0619	.0395	.0242	.0147				.00886				
[illegible]								.0391	.0310	.0155	.0118	.0104				.0104				
[illegible]								.0318	.0241	.0168	.00901	.00715				.00606				
[illegible]								.0389	.0314	.0188	.0124	.00863				.00587				
[illegible]	.440	.230	.110	.260	.180	.0930	.0590	.185	.149	.0906	.0574	.0409		.0690	.0430	.030				
[illegible]	.880	.460	.220	.520	.360	.196	.118	.370	.298	.181	.115	.0818						116	88.4	77.0
[illegible]								.0792	.0649	.0407	.0245	.0147				.00837				
[illegible]								.0371	.0281	.0146	.00970	.00987				.0102				
[illegible]								.0285	.0231	.0153	.00891	.00708				.005811				
[illegible]								.0370	.0294	.0186	.0104	.00832				.00572				
[illegible]	.450	.260	.105	.265	.190	.0980	.2580	.182	.146	.0892	.0535	.0400		.0700	.0430	.0301				
[illegible]	.900	.520	.210	.530	.380	.156	.116	.364	.292	.178	.107	.1800						121	90.6	74.9
[illegible]	.116	.0790	.0420	.0700	.0530	.0360	.0210	.0448	.0353	.0246	.0181	.0113		.0190	[illegible]	[illegible]				
[illegible]	.928	.624	.320	.560	.424	.288	.168	.358	.282	.198	.145	.0904	4xC4	.0760	[illegible]	.033		139	106	79.1
[illegible]	.105	.0660	.0350	.0610	.0490	.0310	.0180	.0414	.0328	.0218	.0148	.00994		.0180	.0110	.00695				
[illegible]	.840	.528	.280	.488	.392	.248	.144	.331	.262	.174	.118	.0795	4xC2	.0720	.0440	.028		123	94.1	70.7
[illegible]	.0950	.0600	.0320	.0550	.0440	.0280	.0160	.0351	.0324	.0189	.0128	.00917		.0160	.00960	.00651				
S(C1')	.760	.460	.256	.450	.352	.224	.128	.278	.259	.151	.102	.0734	4xC1	.0640	.0380	.058		111	84.8	69.2

TABLE A 6 (Continued)

* Note: Correct all cesium 137 data by multiplying by a factor of 0.924. See explanation on the first page of the Appendix.

Contaminant: Cesium 137
Wall Thickness: 129 psf
Area of Simulated Unit: 285 ft²

Detector Position	Determined Graphically							Source Positions (mr/hr)/curie						Determined Graphically				Dose Rate Contribution Per Row (mr/hr)/(curie/ft²)		
	46	47	48	50	51	52	53	55	56	57	58	59		49	54	60		Row J	Row K	Row L
a_1								.0160	.0126	.00869	.00529	.00409				.00337				
a_2								.00557	.00298	.00230	.00193	.00171				.00219				
a_3								.00654	.00520	.00365	.00303	.00164				.00139				
a_4								.0152	.0105	.00730	.00446	.00269				.00198				
ΣA	.117	.0620	.0330	.0740	.0490	.0270	.0170	.0443	.0313	.0219	.0147	.0102		.0210	.0130	.00887		127	98.9	72.4
2(ΣA)	.234	.124	.0660	.148	.0980	.0540	.0340	.0866	.0626	.0438	.0294	.0204								
b_1								.0122	.0103	.00715	.00483	.00324				.00264				
b_2								.00804	.00613	.00363	.00268	.00207				.00198				
b_3								.00827	.00666	.00452	.00298	.00209				.00177				
b_4								.0125	.009[illegible]	.00718	.00444	.00270				.00198				
ΣB	.120	.0540	.0290	.0800	.0430	.0250	.0160	.0410	.0327	.0225	.0149	.0101		.0200	.0120	.00834		121	96.9	71.5
2(ΣB)	.240	.108	.0580	.160	.0860	.0500	.0320	.0820	.0654	.0450	.0298	.0202								
C6'	.0250	.0160	.00900	.0140	.0110	.00700	.00400	.00973	.00753	.00517	.00382	.00241		.00480	.00330	.00210				
8(C6')	.200	.128	.0740	.112	.0880	.0560	.0320	.0778	.0602	.0414	.0306	.0193	4xC6	.0190	.0132	.00420		120	85.8	66.7
C3'	.0270	.0180	.0100	.0160	.0130	.00830	.00480	.0112	.00815	.00549	.00384	.00264		.00480	.00300	.00210				
8(C3')	.216	.144	.080	.128	.104	.0664	.0384	.0896	.0652	.0439	.0307	.0211	4xC3	.0190	.0120	.00420		131	99.5	78.7
C0'	.0180	.0120	.00680	.0110	.00900	.00600	.00330	.00723	.00518	.00357	.00268	.00180		.00340	.00220	.00145				
8(C0')	.144	.0960	.0544	.0880	.0720	.0480	.026	.0578	.0414	.0286	.0214	.0144	4xCo	.0140	.00880	.00580		87.8	69.3	48.2
d_1								.0127	.0101	.00702	.00460	.00300				.00225				
d_2								.00984	.00783	.00573	.00332	.00251				.00235				
d_3								.00884	.00650	.00411	.00318	.00206				.00298				
d_4								.00984	.00804	.00589	.00350	.00238				.00169				
ΣD	.105	.0660	.0320	.0630	.0490	.0290	.0170	.0412	.0325	.0227	.0146	.00995		.0180	.0110	.00827		121	91.2	71.0
2(ΣD)	.210	.132	.0640	.126	.0980	.0580	.0340	.0824	.0650	.0454	.0292	.0191								
E4'								.0160	.0120	.00807	.00566	.00339				.00236				
								.00863	.00496	.00338	.00281	.00228				.00240				
								.00731	.00612	.00352	.00261	.00186				.00187				
								.00991	.00726	.00509	.00332	.00220				.00174				
ΣE4'	.107	.0640	.0310	.0660	.0470	.0270	.0160	.0418	.0303	.0201	.0144	.00973		.0190	.0114	.00837		121	92.1	68.7
2(ΣE4')	.214	.128	.0620	.132	.0940	.0540	.0320	.0836	.0606	.0402	.0288	.0195								
E2'								.0150	.0126	.00896	.00449	.00341				.00227				
								.00815	.00468	.00350	.00266	.00231				.00241				
								.00731	.00565	.00395	.00227	.00179				.00169				
								.00966	.00718	.00509	.00341	.00210				.00165				
ΣE2'	.105	.0640	.0290	.0630	.0490	.0270	.0150	.0401	.0301	.0215	.0128	.00961		.0180	.0110	.00802		118	90.9	67.3
2(ΣE2')	.210	.128	.0580	.126	.0980	.0540	.0300	[illegible]	.0601	.0430	.0256	.0192								
C4'	.0290	.0200	.0100	.0170	.0140	.00900	.00540	.0119	.00823	.00581	.00389	.00163		.00500	.00520	.00225		140	107	74.4
8(C4')	.232	.160	.0800	.136	.112	.0720	.0430	.0952	.0658	.0465	.0311	.0130	4xC4	.0200	.0120	.00890				
C2'	.0240	.0170	.00980	.0140	.0110	.00760	.00450	.00939	.00815	.00512	.00332	.00242		.00460	.00280	.00198		120	87.8	67.0
8(C2')	.192	.136	.0780	.112	.0880	.0608	.0360	.0751	.0652	.0409	.0266	.0194	4xC2	.0180	.0110	.00792				
C1'	.0220	.0140	.00800	.0120	.0110	.00700	.00420	.00823	.00669	.00444	.00308	.00212		.00400	.00200	.00173		105	80.9	57.9
8(C1')	.176	.112	.0640	.0960	.0880	.0560	.0340	.0658	.0535	.0355	.0246	.0170	4xC1	.0160	.0100	.00692				

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2	Dr. Eric T. Clarke, Vice President, Technical Operations Research, Burlington, Massachusetts
1	Radiation Effects Information Center, Battelle Memorial Institute, ATTN: Mr. Walter H. Veazie, 505 King Avenue, Columbus 1, Ohio
1	Aerojet-General Nucleonics, P. O. Box 86, ATTN: Barbara M. Probert, San Ramon, California
1	Commanding General, White Sands Missile Range, ATTN: Mr. Glenn E. Elder, Nuclear Effects Laboratory, New Mexico
1	The RAND Corporation, 1700 Main Streets, ATTN: Dr. [illegible] I. Marcum, Physics Department, Santa Monica, California
2	The RAND Corporation, 1700 Main Street, ATTN: Dr. Jerald E. Hill, Santa Monica, California
1	Hughes Aircraft Company, P. O. Box 3310, ATTN: T. D. Hanscome, Building 393, MS B121, Fullerton, California
4	Atomics International, P. O. Box 309, ATTN: Library, Canoga Park, California
1	Brookhaven National Laboratory, Technical Information Division, ATTN: Classified Documents Group, Upton, New York
1	Sandia Corporation, P. O. Box 5800, ATTN: Technical Library, Sandia Base, Albuquerque, New Mexico
1	Sandia Corporation Livermore Laboratory, P. O. Box 969, ATTN: Technical Library, Livermore, California
1	Martin-Nuclear, Division of Martin Marietta Corporation, P. O. Box 5042, Middle River, Baltimore 20, Maryland
1	Oak Ridge National Laboratories, Radiation Shielding Center, P. O. Box X, Oak Ridge, Tennessee
1	University of California, Lawrence Radiation Laboratory, Technical Information Division, P. O. Box 808, Livermore, California, ATTN: Clovis G. Craig
5	Major Robert W. Vollett, Canadian Liaison Officer, Building 3310, Edgewood Arsenal, Maryland

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Nuclear Testing Division, U S Army Nuclear Defense Laboratory, Edgewood Arsenal, Maryland

ATTENUATION OF FALLOUT RADIATION AS A FUNCTION OF CONCRETE BLOCKHOUSE WALL THICKNESS

Murray A Schmoke, Ralph E Rexroad

NDL-TR-43, October 1963
Task Number 1A022601A089-01
UNCLASSIFIED REPORT

This experiment was conducted to verify theoretical calculations of wall thickness effect on the shielding characteristics of a concrete blockhouse located in a uniformly contaminated fallout field Two gamma emitters, cobalt 60 and cesium 137, were used to simulate uniformly contaminated fallout fields The dose rates at various locations within the blockhouse were measured through wall thicknesses of 48 psf, 93 7 psf, and 139 psf with ionization-chamber dosimeters Reduction factors were calculated from the data taken at the center detector positions and compared with reduction factors computed from the theoretical calculations of Dr L V Spencer, National Bureau of Standards

1 Radiation Shielding Residual
2 Shielding, Concrete Blockhouse
3 Structural Shielding
4 Fallout, Simulated, Shielding of

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